

PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Improvements in or relating to Vehicle Bodies

I, JEAN ETIENNE FELIX CAMBESSEDES, of 18 Boulevard Arago, Paris (18^e). France, a French Citizen, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:

This invention relates to convertible vehicle bodies which may be, as the driver desires, converted from open to closed condition or vice versa while the car is either stationary or moving.

According to one feature of the invention, known members of the body structure such as the rear deck cover with its side-walls, the sliding roof, and side window frames are modified and a variable number of these members employed to close the body.

Another feature of this invention resides in the use of certain of these known members modified to function in concert during the actuation. One of these members is the flap or cover of the rear deck, which cover is suitably pivoted at the rear of the car. The second of these members comprises a roof, preferably of metal, having a similar shape to that of the cover, and fitted at the bottom of its side-walls with slides, which guide it by sliding in grooves provided in side-walls of the cover.

According to the present invention provision is made of a vehicle body arranged so as to be converted from open to closed form as desired, in which a cover or flap hingedly mounted at the rear end of the vehicle so as to extend forward to cover a selected portion thereof is slidably connected to a movable roof portion which is shaped to conform to the shape of the cover or flap or adapted to assume a shape in conformity therewith so as to be telescopically contained within or upon the cover or flap when the vehicle is in the open form.

By means of a slow rotary motion around the rear axis of the cover, the latter and the roof, which are telescoped when the car is open, are slowly raised in a vertical direction and the roof is then ejected from the flap or cover. The roof part comes to rest on the top of the wind-

shield, in order to cover the open top of the body and thus close the vehicle.

In this manner, a coach-work covering structure preferably of metal is obtained having a rigid and stream-lined shape and in effect practically a one piece body. It is securely mounted upon hinges at the lower rear portion of the vehicle and held on both sides thereof by ribs which are situated at the lower edge of said side-walls and slide in grooves in the body of the car. Draughts and eddy-winds are thus suppressed when the roof and cover are raised as when the latter are in elevation the air cannot pass under them; moreover, the junction of these two members allows in practice the separate manipulation thereof.

In another constructional form of the invention wherein the roof and cover depend one from the other, the cover may be extended to form in part the sides and doors of the car, and may thus extend to the windshield. This facilitates the construction of cars or other vehicles with multiple doors. The upper edges of these side-portions of the coach-work, which, of course, move together with the cover since they are now part of the latter, are provided with grooves intended to receive the edges of a sliding roof preferably made of a single sheet of canvas or sheet-iron adapted to roll up, or made of several pieces of sheet-iron constructed telescopically so as to slide one on the other along guiding grooves and also in the other grooves on the edges of the car; these telescopic roof members preferably move longitudinally of the vehicle.

A second characteristic of this invention is to be found in the provision of power lifts or jacks which are dependable in action and actuate the inter-dependending cover and roof ensemble; initially imparting thereto a rising motion and then to the roof alone a substantially horizontal forward movement.

Two systems of actuating the cover and roof may generally be used: in the models of one series, power is applied to the roof alone, the cover pivoted at the rear necessarily assuming its correct position. In the second series it is the cover to which

the power is first applied and then subsequently the movement of the roof is continued alone.

Other constructional features of the invention as for example modified doors, shafts serving as lifting means, side pieces displaced in the rising movement of the covering means for the obturation of side-walls, will be described hereinafter.

10 The combination of these elements according to the present invention will serve to produce various forms of vehicle bodies known in the art under various names according to whether they have 15 two, four or multiple windows, two, four or multiple doors, and are open, closed or convertible.

A number of constructional forms of the invention will now be described by way of example with reference to the accom- 20 panying drawings in which:—

Figure 1 shows in side elevation a two door type of automobile body, which is 25 closed by a two piece cover and roof member, the respective pieces of which are relatively movable.

Figure 2 shows in side elevation a two door type of automobile body, which is 30 closed by a three piece cover and roof structure of metal, the pieces of which are relatively movable, the cover covering the rear of the vehicle and the extreme back part of the cover being con- 35 stituted by a second movable piece, while the roof covers are seats. These parts are power actuated without regard to the running speed of the motive unit of the vehicle.

Figures 3, 4 and 5 are the details of the 40 arrangement shown in Fig. 2.

Figure 6 is a car-body having a two piece covering structure, the cover and the roof being actuated by a device which is 45 automatically controlled in the extent of its action.

Figure 7 is also a side elevation of a two door body, in which the movable cover 50 pivots in an axis at the bottom, rear portion of the car and on which the roof slides, while the parts are actuated by the motive unit of the vehicle through a lever system.

Figure 8 shows in side elevation a modified construction according to this inven- 55 tion in which two levers raise the back part of the roof, while two closure members are moved by the raising of the roof to close the gaps in the sides of the body.

Figure 9 is a variation of the construction shown in Fig. 8 in which the cover 60 is raised by a modified lever system, while the raising and lowering mechanism is manually operated.

Figure 10 is a side elevation of a 65 different type of body. The sides of the

cover are continued into the doors and the roof which can be rolled up covers the car.

Figure 11 shows two detail views drawn to a larger scale.

Figure 12 is a side elevation of a modification of Fig. 10, wherein the roof is 7 pulled either one way or the other by force applied to its ends.

Figure 13 is a modification of Fig. 12, 7 in which the roof is constituted by two metallic plates which are engaged at both ends in the actuation thereof.

Figure 14 shows a detail of the mechanism for moving the roof of a vehicle. 8

Figure 15 is a side elevation of a modified construction according to the inven- 8 tion showing more particularly an arrangement of power-driven means for moving the roof and cover members.

Figure 16 is a rear half view showing a detail of the construction of Fig. 15, 9 and

Figure 17 is a plan view of Figure 16.

Referring to Fig. 1 a cover 1 is shown 9 with sides pivoting on axle 2 at the rear of the car. A roof 4 slides on cover 1 and is guided and assisted in its movement by the runners 10 which are rotatably mounted upon the side walls of the 9 roof 4 and run in lateral grooves 3 formed in the fixed portion of the vehicle body. A hydraulic jack 5, the bottom of which is pivotally secured at 6 to the vehicle body while the ram thereof engages the 10 roof 4 at 7, receives fluid under pressure through a pipe 9 from pump 8, which is actuated by the motive unit or by hand. When the roof 4 and the cover 1 are moved one into the other the car body 10 assumes the form of a torpedo. To erect the cover and roof oil under pressure is admitted to the jack 5 whereupon parts 1 and 4 rise together, whilst the roof 4 is moved forward from the cover 1 which is 11 held by stops (not shown in the drawing). The hydraulic jacks have relief ports in the piston 11 which serve to return the liquid to the pump reservoir through a pipe not represented on the drawing. 11 Thus the drive of the actuating device is maintained at a predetermined rate without regard to the speed of the motive unit.

In Fig. 2 is shown a similar covering 12 arrangement comprising the cover 12 (Fig. 3) and roof 13 (Fig. 4) which have 12 slides 14 and 15 respectively at the lower edges of their sides and also grooves 16 and 17 respectively in the upper portions 12 of the said sides. The cover moves in a housing formed by the rear portion of the fixed body upon runner wheels 18 sliding in grooves 19 which extend from the bottom to the top of the body. It is main- 13

tained in the requisite position by two spring-loaded connecting rods 20. These movements of the two covering pieces can be achieved by the force of springs (not shown) interposed between the rear end 5 21 and the cover 12. In this embodiment however the motion is imparted to the covering members 12 and 13 by the motor 22 through clutch gear 23 controlled by a lever 24, transmission shafts 25, 26 with 10 appropriate ball-joints which communicate the movement to a worm 27 and pinion 28, to drive the sprocket chains 30.

The chains 30 pass around small guide 15 sprockets, journaled upon the fixed body, in such a way that fingers 31 carried by the chain enter slots in members 32 which depend from the roof member 18. The roof is thus moved forward independently 20 of the cover 12 in the direction of arrow 33. This movement of the roof relative to the cover 12 is obtained by attaching the cover to the fixed body of the vehicle. The window apices shown in the sides of 25 the roof member 13 may be glazed if desired. 34 represents two triangular pieces of sheet-metal with hinges 35, which are adapted to fold down to the bottom of the rear of the car, their purpose being, if 30 necessary, to cover the gaps between 12 and 13.

In the above described embodiments as in the embodiments hereinafter described the cover and the roof members will have 35 superimposed grooves concentrically curved or not, regarding their own slides and arranged to enter slides fixed on the body of the car. Furthermore, the slides or guide rails attached to the cover and 40 roof members are adapted for application to flat or domed surfaces and in horizontal or inclined position as desired. To simplify the drawings, all of such grooves and/or slides have not been indicated. 45 Thus, in Fig. 6 in which is shown metallic sheet members 36 forming part of the cover and pivoted at 37 to the back of the car, the chains 38 travel in the grooves 39 which also serve to receive the slides of 50 the cover 40 and the roof 41. The forward ends of grooves 39 are superposed on fixed grooves 42 provided in the body to receive the slides of the roof 41 when the latter is in extended position.

Here the movement which is reciprocatory is transmitted, as previously by clutch gear but the latter is followed by a speed control unit which is in a hermetic box 43 and for example is of the type as 60 used industrially in machine-tools. The speed control box 43 is followed by a selector box 44 serving through a counter or revolutions meter selectively to stop the movements of the actuating gear in 65 due time. The movement given by the

shaft 45 is transmitted by a series of gears contained in gear box 46 to screws 47. The latter are turning in nuts 48 which are fixed to members 36 and bear at their upper part a cylindrical enlargement 70 which has a circular groove. Helical pinions 50, provided with a sliding key, which is visible on the drawing, are formed at the lower end with a cylindrical bore which embraces the bosses of the 75 nuts 48, and are linked to the latter by lugs 51 entering the circular grooves of said nuts. The screws 47 each have a longitudinal groove 49 in which enter the pinion keys 50, thus providing a sliding 80 keyway. Since the nuts 48 can not turn as they are secured to members 36, they will necessarily be moved, by rotation of screws 47, in an ascending or descending 85 movement and they will bring in such movement the helical pinions 50, which, due to the sliding keys, will rotate with the screws. The movement is equally transmitted to members 36 which are 90 pivoting around axes 37. The members 36 are also provided with helical pinions 52 which are in constant mesh with pinions 50. The pinions 52 are keyed on the same shaft as chain sprockets 53 95 which are transmitting the movement to the chains 38. The latter are provided with engaging lugs 54 which are fixed to the roof 41.

Relation between the various series of gears is provided in such manner that the 100 rising movement of the telescoped cover and roof members is fully achieved while the forward movement of the roof 41 is either totally or partially effected. In such case the screw threads 47 are suitably 105 interrupted in the upper part, precisely in due position for the nuts ceasing to rise, though pinions 50 and 52 continue to rotate. The drive will finally be halted at the moment when said roof comes into 110 contact with the upper part of the windshield, by means of the revolution meter above referred to while penetration of the roof slides into the fixed grooves 42 will keep the screw slightly away from the 115 nut so as to avoid wearing. In the opening movement of the covering means the operator will place the control lever in the reverse position.

In Figure 7, the cover 55 is shown sup- 120 porting a roof with a flat top 56 through semi-circular ribs 57. In this modification when the upward movement is partly effected said semi-circular ribs 57, inserted if so desired in grooves of the cover 125 not represented on the drawing, enter the semi-circular grooves 58 fixed on the body of the car. Circular grooves 59 are provided to serve as accessory guides and to equalise the friction surfaces of cover and 130

roof.

The motor, through a shaft and worm 60, the pinion 61 and crank 62 gives to the connecting-rod 63 and to the crank 64 a reciprocatory movement. This movement is transmitted to both stub axles 65 on which are keyed two pitmen 66 clamped at their upper extremities to the roof which is by this means actuated downwards or upwards. This motion may be stopped by any suitable means.

If it is intended to use this device for the back of the body of a motor coach or other heavy vehicle the following members may be added: the helical gears 67 and 68, the bevel gears 69 and 70 driving by the shafts 71, cardans 72 and shafts 73, the pinions 74, which transmit the drive directly to the chains fixed to the lateral edges of the flat or curved roofs it is desired to use.

In Figure 8 the roof and the cover are interdependent. The rollers 76 of the latter run in the grooves 75 of the former. The roof is raised from the back by two large levers to which is imparted as above described an upward or downward motion. The other members 77, which rotate about the axis 78 are carried forward by the forward part of the roof which is of modified design, owing to the tractive action of the springs 79 exercising a constant pressure at the top of the members. The members 77 are shaped so as to form the closing part of the sides of the doors or the windows. In order to raise or lower triangular pieces similar to the members 77, by means of the windows of the vehicle, the said triangular pieces would be provided with grooves 80, in which the roof front rollers would have been engaged for guide purposes, the cover when so arranged being actuated by a spring and controlled by the movement of the window frame.

By using a combination of the constructions shown in Figs. 7 and 8, it is possible to design various other arrangements, widely differing in appearance.

Furthermore, in Fig. 7, all that part of the roof and cover which is to the rear of the vertical plane passing through lever 66 could be of fabric providing that the lower edges of these fabric covers are attached to rigid hoop-like members conforming to the shape of the rigid covers 55, 56 and arranged to carry guide ribs 57 for the purpose stated.

Fig. 9 shows an alternative to the device depicted in Fig. 8. The roof held rigidly by four levers raises the front edge 82 of the cover, when moved rearwards, and comes to rest when lowered under the cover. The whole device is operated at constant speed by hand by any suitable

mechanism. The guiding grooves which are not shown but are similar to those described in the previous embodiments, stop the roof when fully open or shut; the lower edges of the roof side pieces being always enclosed in the side-walls of the fixed body of the vehicle cannot injure the passengers.

Figs. 10, 11, 12 and 13 represent coach-bodies of an alternative type, in which the sides of the raised coachwork, instead of being dependant on the roof are dependant on the cover. Here again the roof is connected to the cover in a characteristic way.

In Fig. 10, the cover fitted with two crank-arms and a lifting rear end 83, pivots about two shafts 84 and 84a, the latter being attached to the body. Stub shafts 85 (one of which is shown in the drawings) carrying pinions 100 are mounted on extensions 86 of the cover sides in the doors. Chains 102 travelling in guides 102a are attached to a flexible roof member 102b which is alternately extended between the cover sides and rolled round a roller 102c. The chains 102 engage the pinions 100 by which they are driven to displace the roof from open to closed position and vice versa. A lifting motion is imparted to the screws 87, acting as door spindles and fitted for this purpose with two fixed bearings 88 and 89. The two fixed doors each have likewise two bearings 90 and 91 and the two lifting doors a bearing 93. Nuts 94 designed to travel up and down the screws 87, carry rods 95 upon which are slidably keyed pinions 96. The latter being held against the stops 97 by springs 98.

If the device is set in motion by a known driving system indicated in the drawings the nuts 94 travel upwards along their respective screws 87 carrying with them the lifting doors and the cover, until the pinions 96, after the springs 98 have been pressed back, engage the pinions 99, so as to stop the movement of the entire cover and set in motion the roof by means of the rods 95, fitted with worm gears at their upper end, their corresponding pinions 100, the chain cogwheels 101 and finally the chains themselves 102.

In the alternative construction of this nature shown in Fig. 11 the true body beams 103 are provided with fixed flexible flaps 104 armoured inside with spring blades, and covered with upholstery or paint. The flaps are either outside or inside the body. By their spring outer edge 105 the flaps 104 are urged against the lifting side of the body in a leak-proof manner. When the movable side members are with drawn from between the flaps 104 the latter come together to

seal the interior of the vehicle sides.

In the alternative embodiment shown in Fig. 12 the cover extends to the grooves 106 in the windscreen uprights, which are carried down to the foot of the said uprights. The cover comprises a portion 170, which covers the upper, rear part of the vehicle body and is pivotally secured thereto at 172, and side walls 171 which extend longitudinally of the vehicle body. Each side wall lies above the doors of the vehicle when in erect position and is articulated at two places intermediate its length with hinged joints 173, 174 which coincide with the axes of the doors 175 according to the raised or lowered position of the cover. The forward portions of the cover walls are thus hinged to move with the doors 175 when the latter are swung about their hinges.

The forward edges of each cover wall 171 is provided with a gear box 109 in which worm gear comprising a worm 108 and worm wheel 110 are journaled. The worm wheels 110 project from the gear boxes to mesh with the teeth of arcuate racks 176 which are rigidly secured to the body of the vehicle. Splined driving shafts 107 slidably engage the worms 108 to rotate the latter which in turn rotate the worm wheels 110, the shafts being driven through means similar to those described with reference to the previous embodiments.

When the body of the vehicle is closed the articulated portions of the cover walls take their bearing in the guide grooves 106 in the uprights. When the shafts 107 are rotated the worm wheels 110 are rotated and so move up or down the racks 176 while the worms 108 move along the shafts 107. In this manner the cover is moved from the dotted position to the full line position shown in Fig. 12 or vice versa as desired. Sprocket wheels 111 keyed to the worm wheel shafts support and drive a sprocket chain 112 which passes around suitable guide sprockets so as to extend longitudinally of the vehicle cover. The roof 177 is slidably mounted in the cover 170, 171 and is moved from the full line position to the dotted line position shown in Fig. 12 in the movement of the sprocket chain 112 which carries teeth 113 adapted to engage suitable lugs (not shown) provided on the roof portion 177.

In Fig. 13, a roof formed of two pieces of sheet material 114 and 115 is carried forward by one of the actuating systems already described but which comes into operation as soon as the worms 116 are rotated. In addition to the cover 117, the lifting portion comprises two members 118 travelling upwards and carrying with

them two other members 119 by means of the spindles 120, while the rollers 121 slide in the cover grooves (not shown) so that the three telescopic members are forced into the extended position, whereupon the worms 116 are stopped by the speed countering device.

Fig. 14 illustrates the possibility of covering with rigid roofing sheets, curved as in the preceding Figures, a vehicle fitted with several doors. 122 is the top of the front of a rear end-piece of the rigid portion of a vehicle body said part being provided with rollers 123 around which are carried endless chains 124, as in the preceding Figure. These chains carry the first sheet as far as their rollers 123. This sheet will be carried forward by chains 125 attached to the front end and placed above a lifting door as previously described and from this point may travel on to the next door.

In Figs 15, 16, 17 structural details are shown of mechanism located at the back of the seats for operating the movable roof members. The seats are pivoted at 126 and are adjustable by means of hand screws 127. The backs are provided with grooves 128 in which slides attached to members 129 are movable. The members 129 form the lateral portions of the movable roof and extend lengthwise of the vehicle body. The members 129 serve slidably to support the movable roof proper 180 (Fig. 15) which is in the form of a flexible sheet adapted to be housed by the rear deck cover 181 when the vehicle body is opened.

In these Figures the motion of the rear deck cover 181 is controlled by means of a latch 130 pivoted at 181, which is moved upwards by the standard locking device 132 when the door is opened.

A central gear set in box 133 is actuated from the engine by means of shaft 134, reverse gear 135, and clutch 136, thus to drive the several members which serve to displace firstly a windshield 137 through a suitable transmission, as shown in Figs. 15 and 17, secondly the members 129 moved by a lifting worm 138 and other means, and thirdly a rolling roof also driven by a gearing from the box 133.

In this gear box which is similar to an automobile gear box, provision is made of a gear shift to control the motion of every movable member, a selecting device, and a locking disc which turns very slowly. The edge of this disc is slotted to engage lugs formed in the gear box casing so that the movement of the windshield for instance is upwards or downwards in accordance with the position of the locking disc.

One or two movable levers 140 are fixed

on the shaft 139 which carries the shifting gear. These levers 140 move inside grids or gear change gates 141, and the shaft 139 is connected by means of a dog 142 to the reversing gear 136 driven by the adjacent clutch 136, so that according to the axial rotation of the shaft 139 the gear 135 is caused to drive the gears of box 133 in clockwise or anti-clockwise direction.

It will be understood that when rocking the lever 140 to right or to left to engage one or the other of the gears 133, the corresponding body side member should be lifted or moved down, while none of the other members could be put into action but in this case would be lifted or lowered before or after the movement of the first-mentioned member. Four recesses are provided in the grid 141, in order to give motion to the members according to the following sequence: windshield, flap or cover, roof, and windshield again the latter, in order to ventilate the car in hot weather, even when the car is covered. Free actuation of the different members is possible only when the plungers 143 or 144 (according to the angular position of shaft 139) are engaged in the slot in disc 147, fitted on the door spindle, and members 145 and 146 relating to the drive control shaft 139 are engaged with 148 (see on Fig. 15) which is a hollow link of chain 149. By this means it is assured that the mechanism cannot be actuated before the doors and the windows are closed.

To prevent accidental overrun in raising or lowering the cover members, the gear box is provided with a known form of automatic control device which is pre-set to determine and limit the extent of movement of the operative parts. A rod 160a (Fig. 17) passing through the gear box 133 has levers 160 secured to its extremities for the purpose of rocking the rod. Within the gear box the rod 160a is connected to the automatic control device which is reset by the rocking movement of the rod so as to allow the movable parts of the body to continue to some extent their upward motion beyond the normal thus giving the body a higher roof and allowing the roof to advance beyond the windshield when such higher setting is desired. In this arrangement the roof preferably is made of a pliable fabric.

In the middle of the links of the chain 150 (see on Fig. 11) are springs 151 sliding in bearings 152. The upholstery 153 is sewn as at 154, and over is the leather 155, armoured with spring blades 156, the tips of which are fitted with a slide groove 159, which could be shaped to follow the curvature of the top of the car. Due to

this fitting of its edges, the roof of the car can be domed or flattened as required.

In all of the above described embodiments of the invention the movable cover members are arranged to lie between or embrace the rear wheels of the vehicle when retracted to open the body, while being withdrawn from the wheels when extended to close the body.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A vehicle body arranged so as to be converted from open to closed form as desired, in which a cover or flap hingedly mounted at the rear end of the vehicle so as to extend forward to cover a selected portion thereof is slidably connected to a movable roof portion which is shaped to conform to the shape of the cover or flap or adapted to assume a shape in conformity therewith so as to be telescopically contained within or upon the cover or flap when the vehicle is in the open form.

2. A vehicle body as claimed in claim 1, wherein the cover or flap is formed with side members which engage suitable guiding devices positioned upon the fixed portion of the vehicle body substantially as described.

3. A vehicle body as claimed in claim 1 or 2, wherein the cover or flap is formed with side pieces which extend forwardly to form some part of the sides of the vehicle body.

4. A vehicle body as claimed in claim 3, wherein the side extensions of the cover carry glazed panels which may be movable or fixed as desired.

5. A vehicle body as claimed in any of the preceding claims, wherein means are provided for actuating the telescopic cover and roof members so that when in the open position the telescoped members may be raised in a substantially vertical direction and the roof member subsequently moved forward to cover the vehicle.

6. A vehicle body as claimed in any of the preceding claims, wherein the cover is provided with side members which engage with the fixed sides of the vehicle and are provided with slots and/or ribs which engage the roof members.

7. A vehicle body as claimed in any of the preceding claims, wherein the fixed portion of the body is provided with guide means which engage the roof member in such manner as to cause the latter to rise initially in a substantially vertical direction after which it emerges from the cover member.

8. A vehicle body as claimed in any of the preceding claims, wherein the roof member when in situ is different in shape to that of the cover but is brought into conformity therewith when the members are telescoped.
9. A vehicle body as claimed in any of the preceding claims wherein the roof member comprises two parts one of which is connected to the cover member.
10. A vehicle body as claimed in any of the preceding claims, wherein the cover and roof members are actuated by mechanism which imparts alternate raising and lowering movements to the members.
11. A vehicle body as claimed in any of the preceding claims, wherein the operation of the actuating mechanism is automatically controlled in a predetermined manner.
12. A vehicle body as claimed in claim 10 or 11, wherein the actuating mechanism is driven from the motive unit of the vehicle through a transmission device which is within the control of the operator.
13. A vehicle body as claimed in claim 12, wherein the drive of the actuating device is maintained at a predetermined rate without regard to the speed of the motive unit.
14. A vehicle body as claimed in any of the preceding claims, wherein the lateral edges of the roof member or members are constantly enclosed by the side members of the vehicle body.
15. A vehicle body as claimed in any of the preceding claims 10 to 14, wherein the actuating mechanism includes a lever system having a series of levers which directly engage the covering members.
16. A vehicle body as claimed in claim 15, wherein the lever system includes a lever or levers which are secured to the rear of the roof member to act upon the latter while the roof member carries two closure members which serve to close the gaps between the roof and cover members when the latter are raised.
17. A vehicle body as claimed in claim 15 or 16, wherein the lever system includes two levers which are attached to the rear end of the roof member so as to raise the latter while the forward end of the said roof member is brought into bearing contact with the window structures or door spindles of the body.
18. A vehicle body as claimed in any of the preceding claims 1 to 4 and 6 to 17, wherein the roof member is caused to emerge from its telescoped position within the cover member during the upward movement of the latter.
19. A vehicle body as claimed in any of the preceding claims 5 to 19, wherein the force effecting the closure of the members is initially applied to raise the cover member and is then transferred to the roof to effect the forward movement thereof.
20. A vehicle body as claimed in any of the preceding claims, wherein the cover or flap and roof members are provided with appropriately spaced guide grooves and corresponding lugs or ribs which serve to space the members apart and act to guide them in their operative movements.
21. A vehicle body as claimed in any of the preceding claims in which the roof member is carried above the doors of the vehicle.
22. A vehicle body as claimed in any of the preceding claims wherein a door is connected to the cover member by an intermediate element so as to be raised in a substantially vertical direction in the manipulation of the covering members.
23. A vehicle body as claimed in any of the preceding claims wherein the covering members are arranged so as to lie between or embrace the wheels of the vehicle when retracted to open the body while moving clear of the wheels when in the extended position to close the body.
24. A vehicle body as claimed in any of the preceding claims, wherein fixed upper edges of the body are provided with resilient opposed flaps or tongues which engage the movable side members in a leak-proof manner and come together for the same purpose when the movable members are withdrawn therefrom.
25. A vehicle body as claimed in any of the preceding claims wherein the movable roof and/or cover members are provided with guide rails which are adapted to be applied to a flat or domed surface in horizontal or inclined position as desired.
26. A vehicle body as claimed in any of the preceding claims, wherein provision is made of means whereby the movable roof and side members are locked against movement until the doors and/or windows are correctly positioned.
27. A vehicle body as claimed in any of the preceding claims wherein the movable roof member is guided to move upon runners and is constructed substantially of a pliable material which is mounted upon appropriate frames.
28. A vehicle body as claimed in any of the preceding claims, wherein two rigid lateral members pivotally secured to the rear of the body are fitted with concentric guide grooves which register with the guide means carried by the roof and cover members so that the latter are permitted readily to move to the operative

or inoperative position as desired.

29. A vehicle body as claimed in any of the preceding claims 11 to 28 wherein the means for actuating the movable covering 5 members together with the automatic control means and clutch coupling and reversing gear are arranged to be controlled by a single lever.

30. A vehicle body substantially as de-

scribed and shown in the accompanying 10 drawings.

Dated the 7th day of December, 1935.

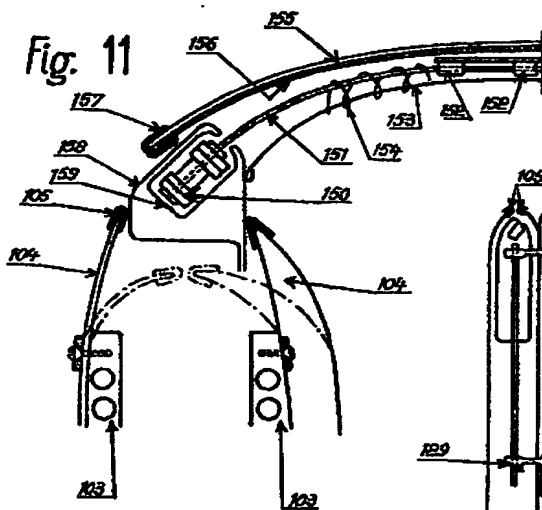
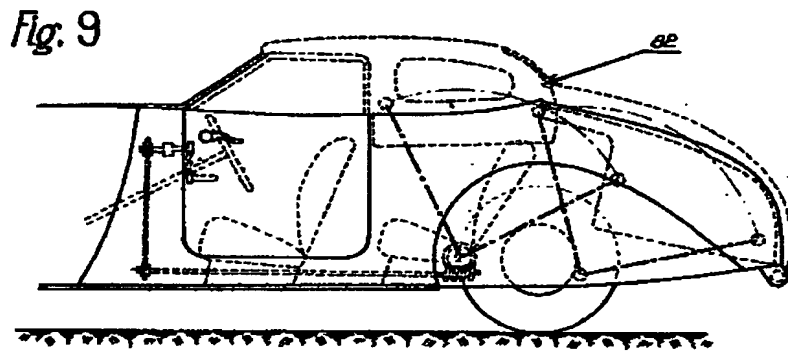
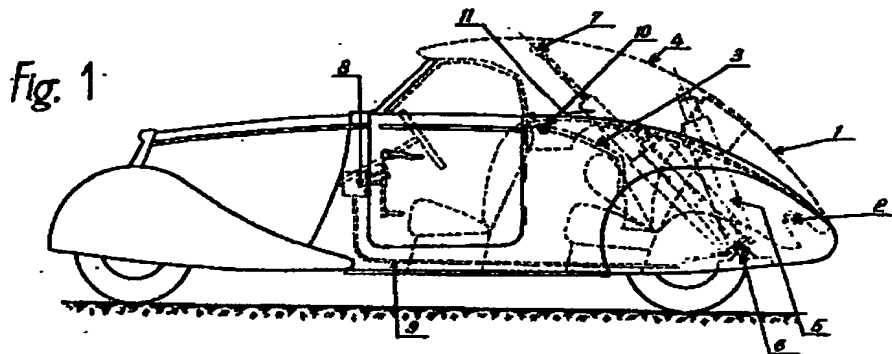
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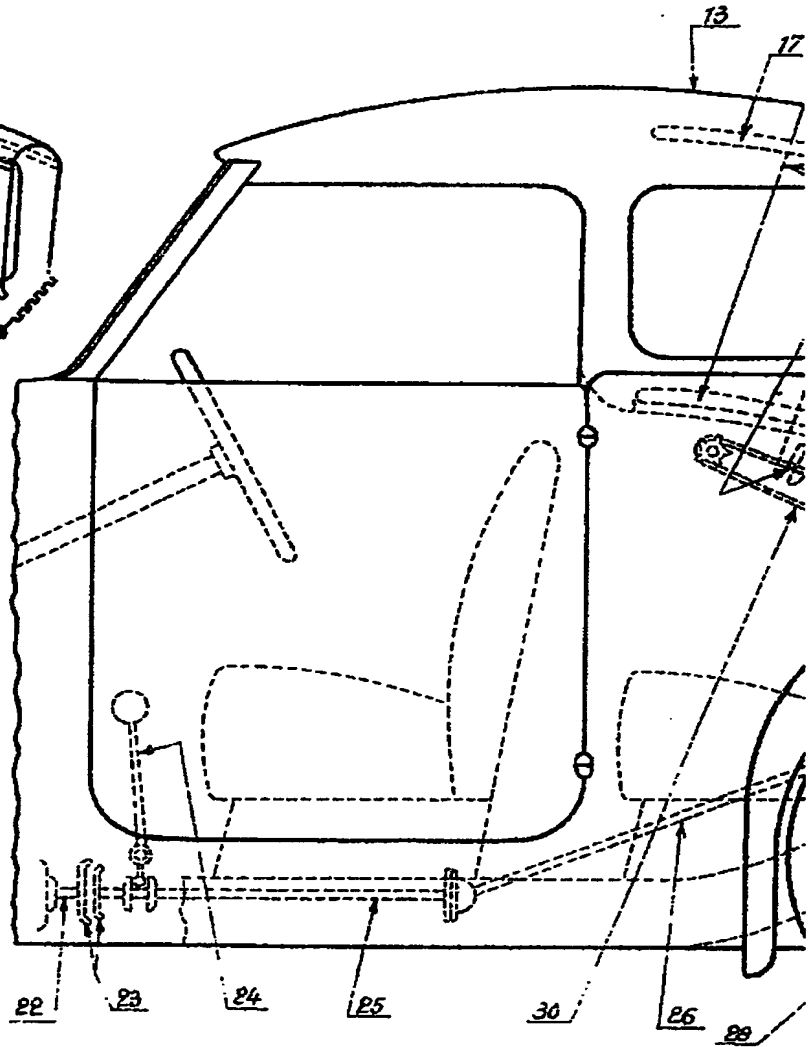
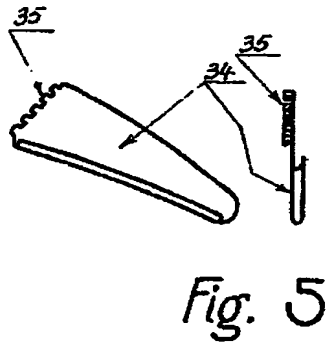
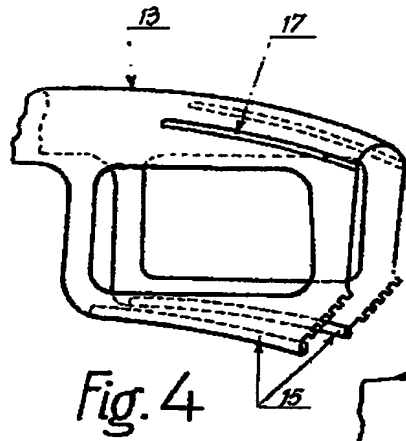
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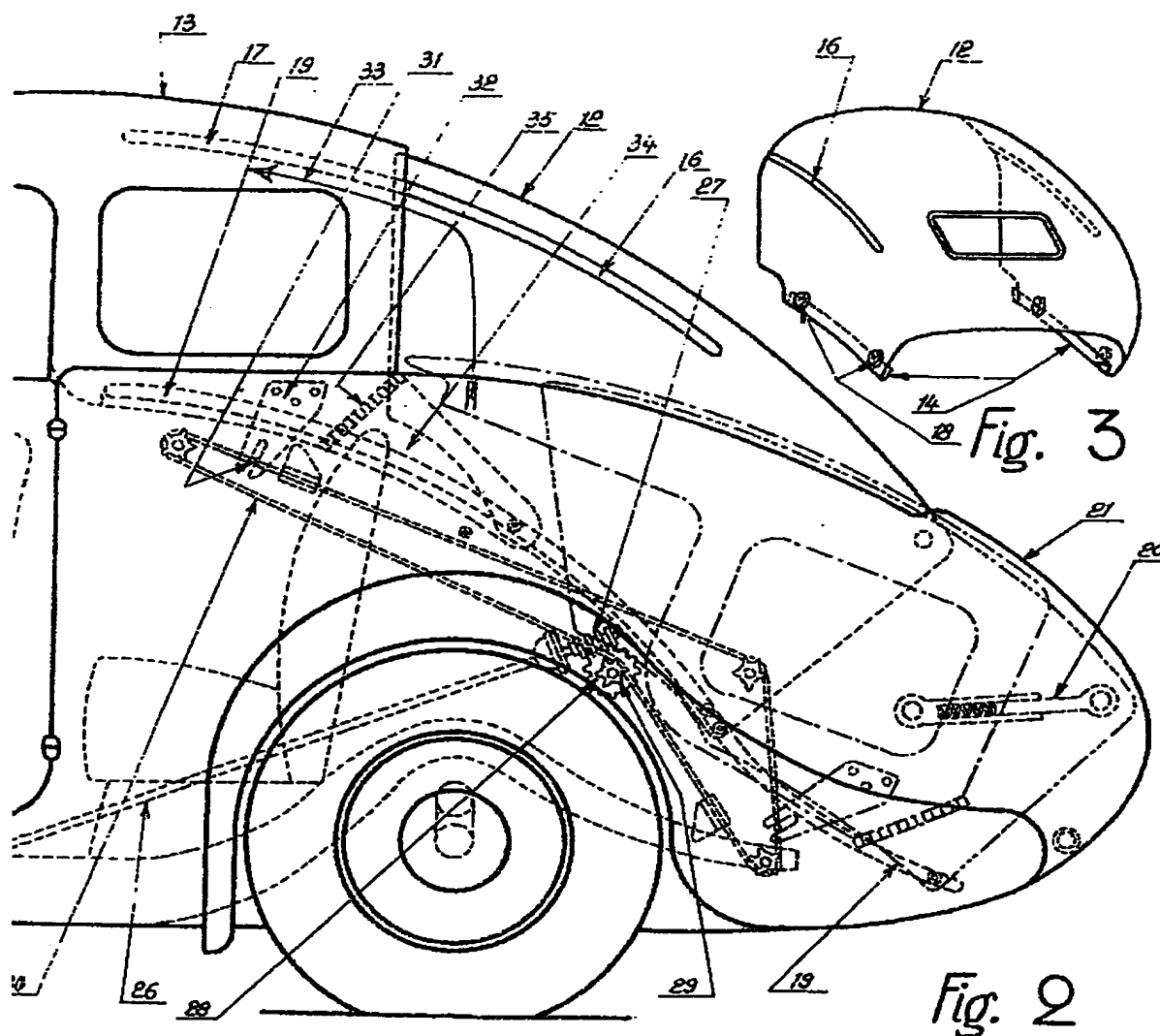
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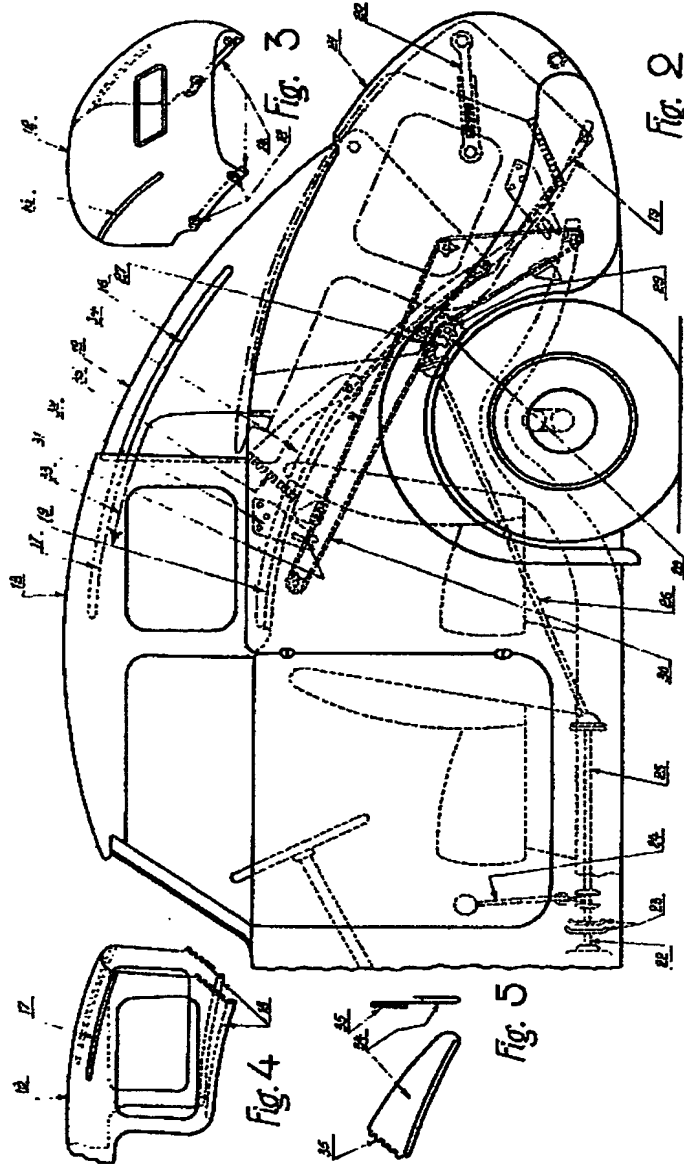
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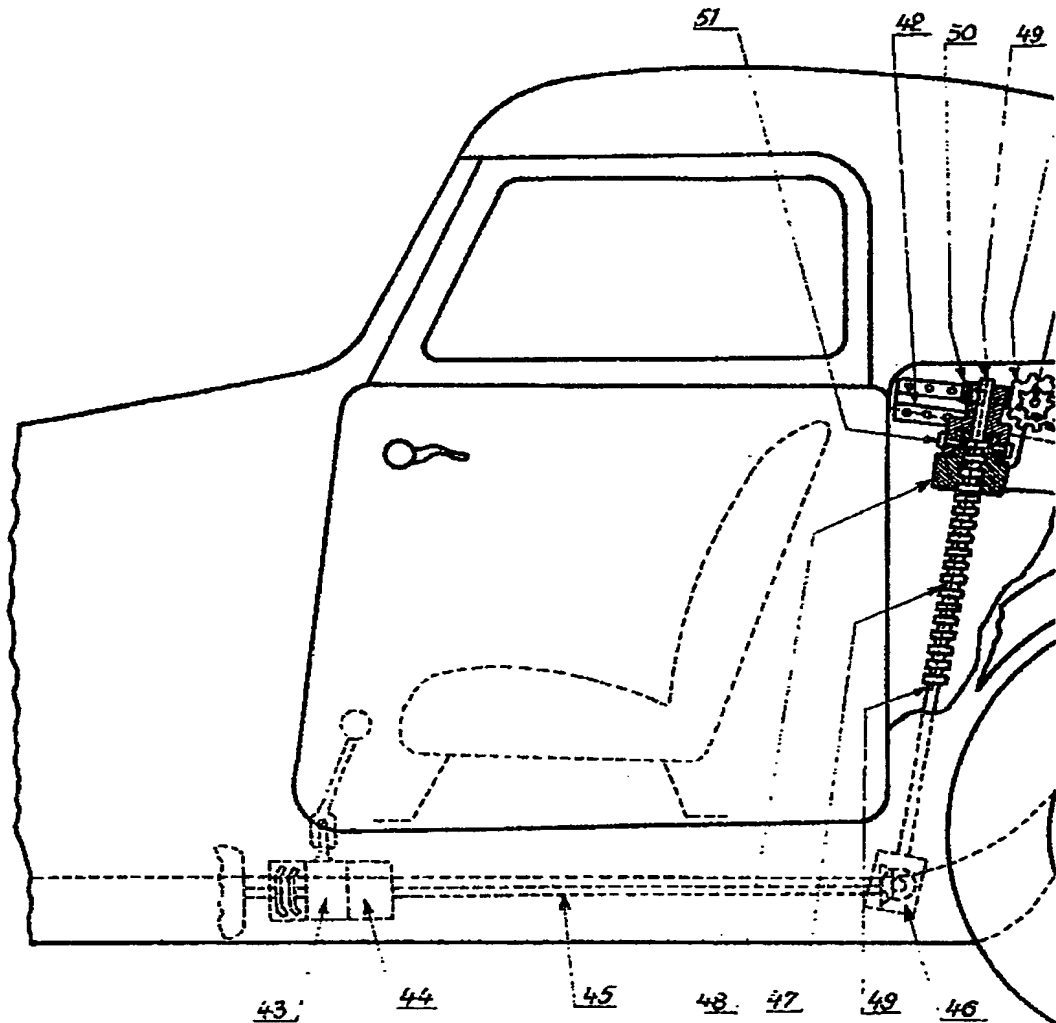
[This Drawing is a full-size reproduction of the Original.]

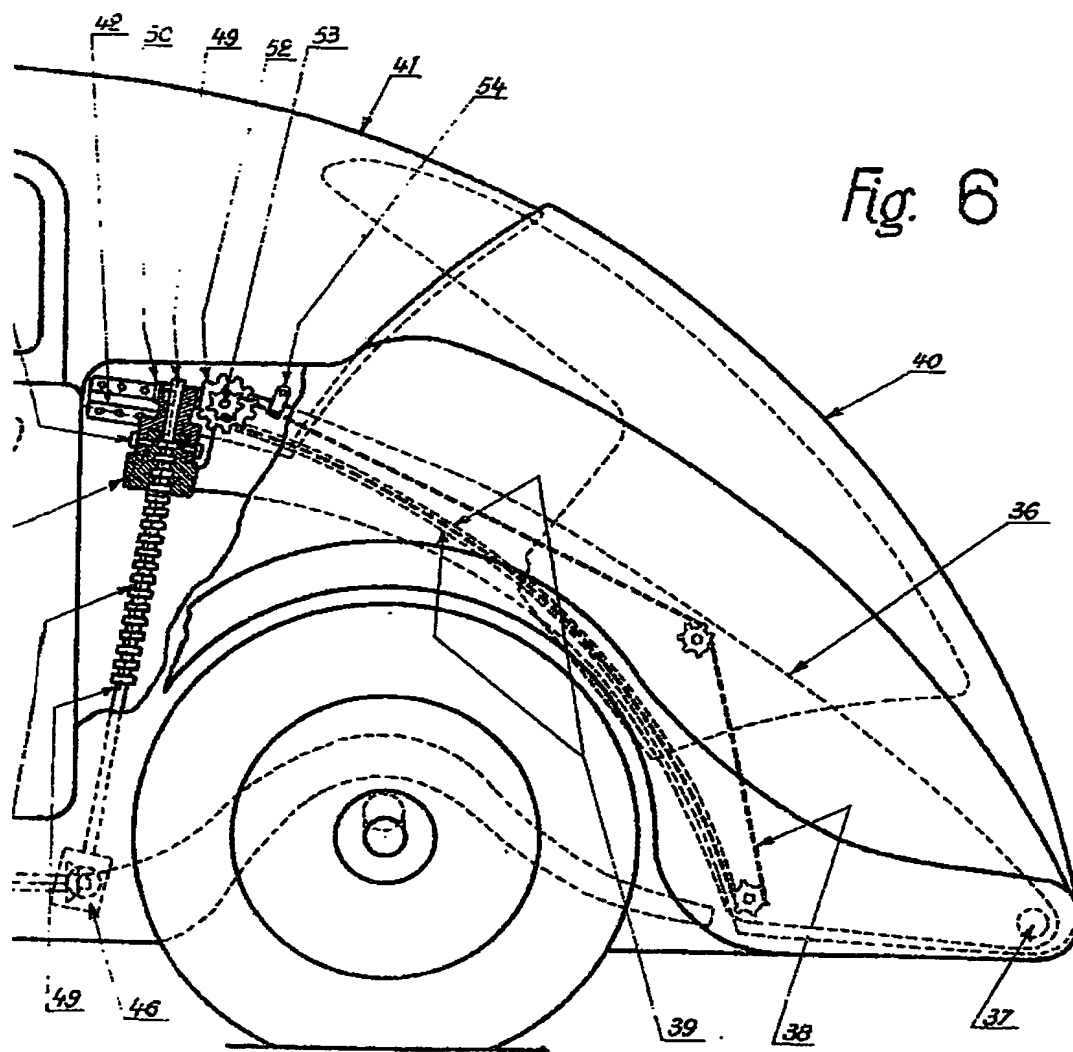






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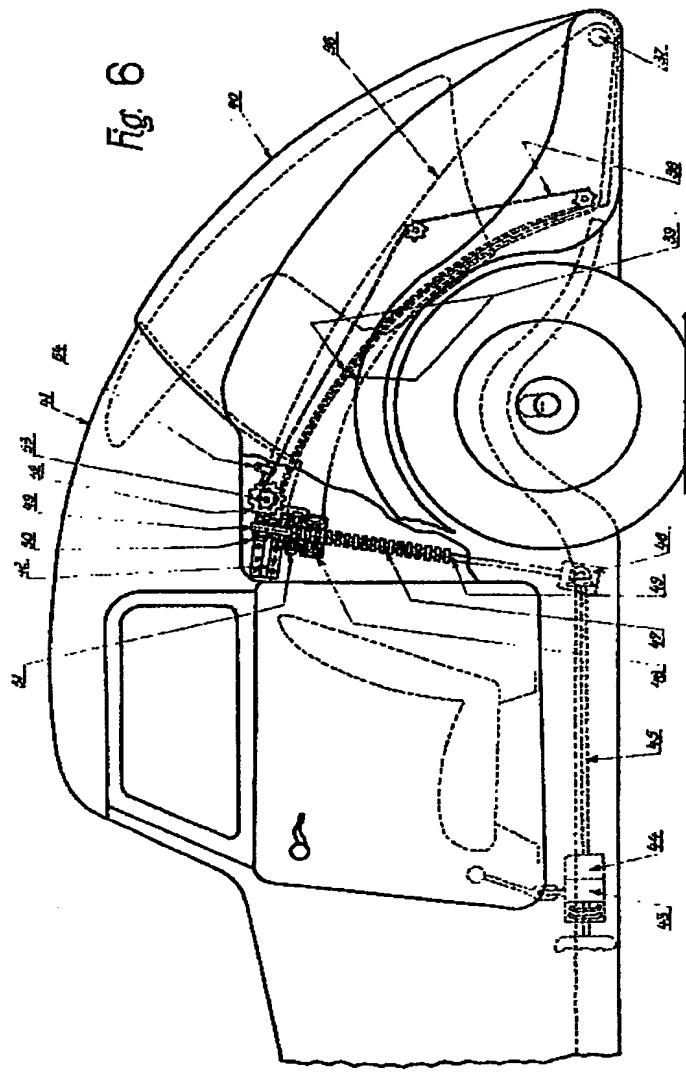
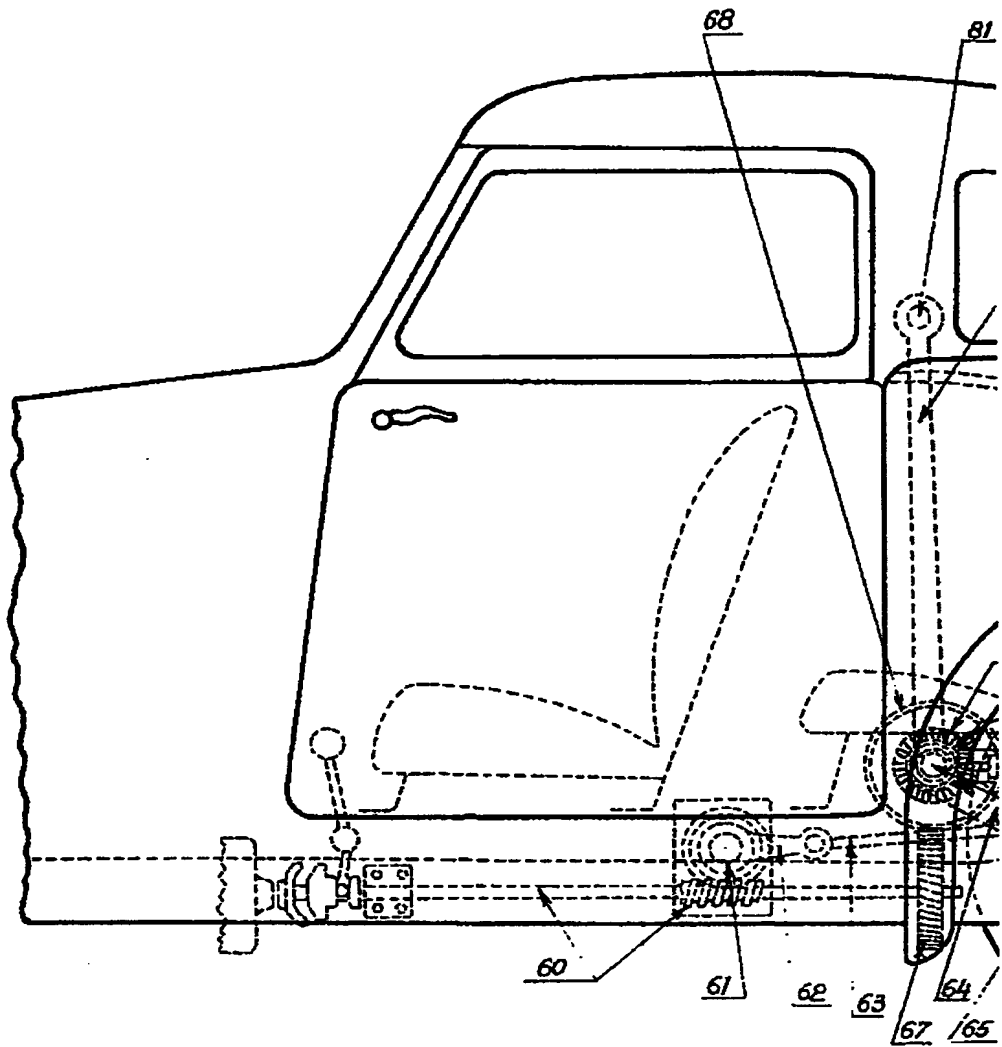


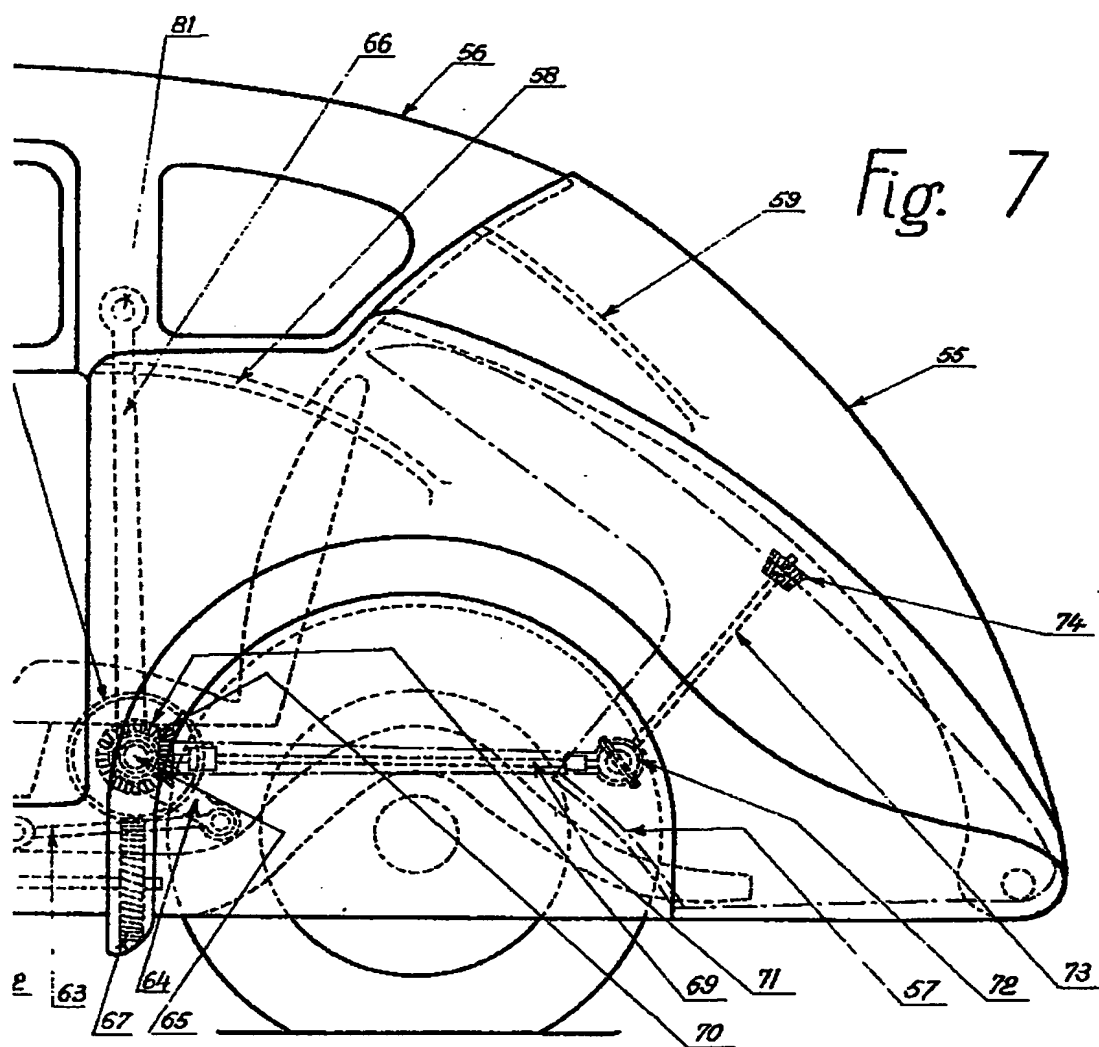
Fig. 6

[This drawing is a full-size reproduction of the Original.]

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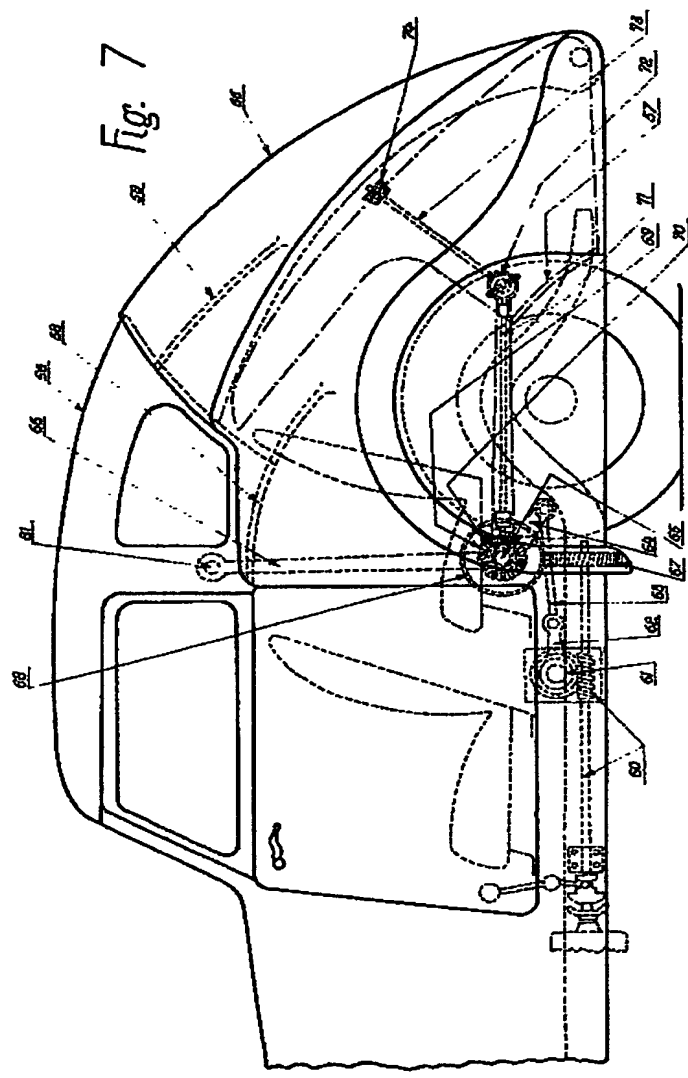


Fig. 7

[This Drawing is a full-size reproduction of the Original.]

[This Drawing is a full-size reproduction of the Original.]

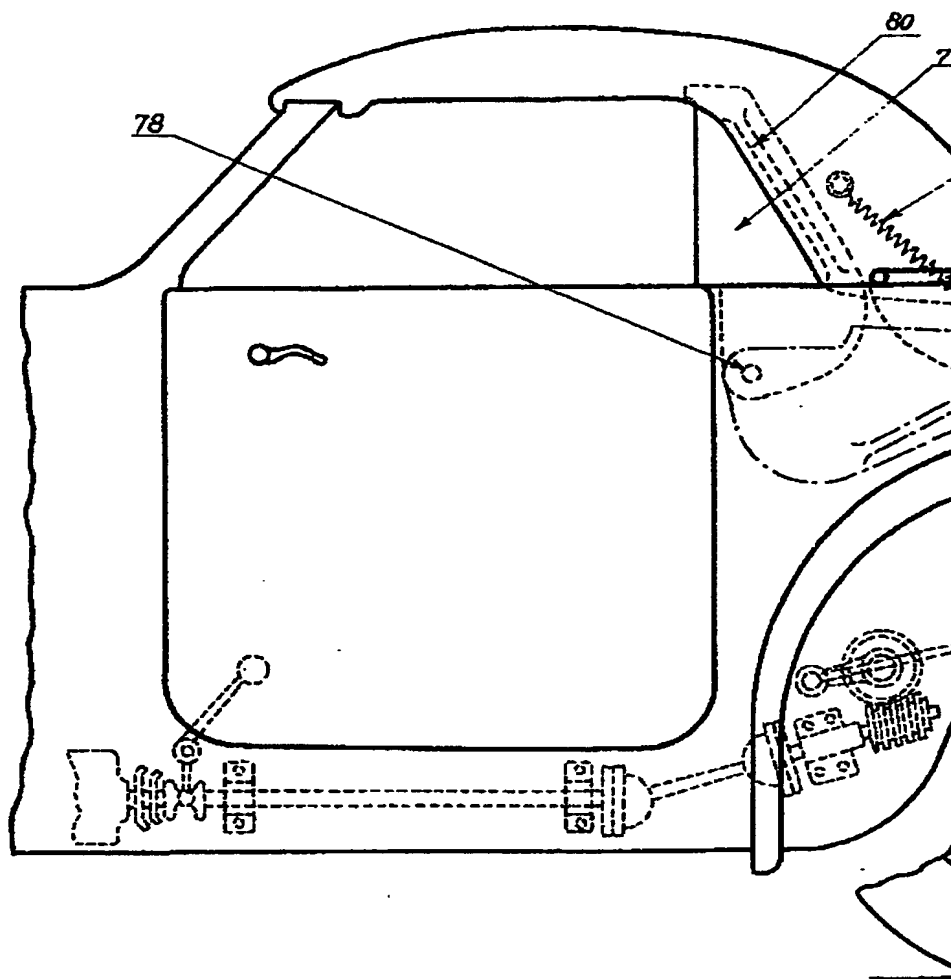
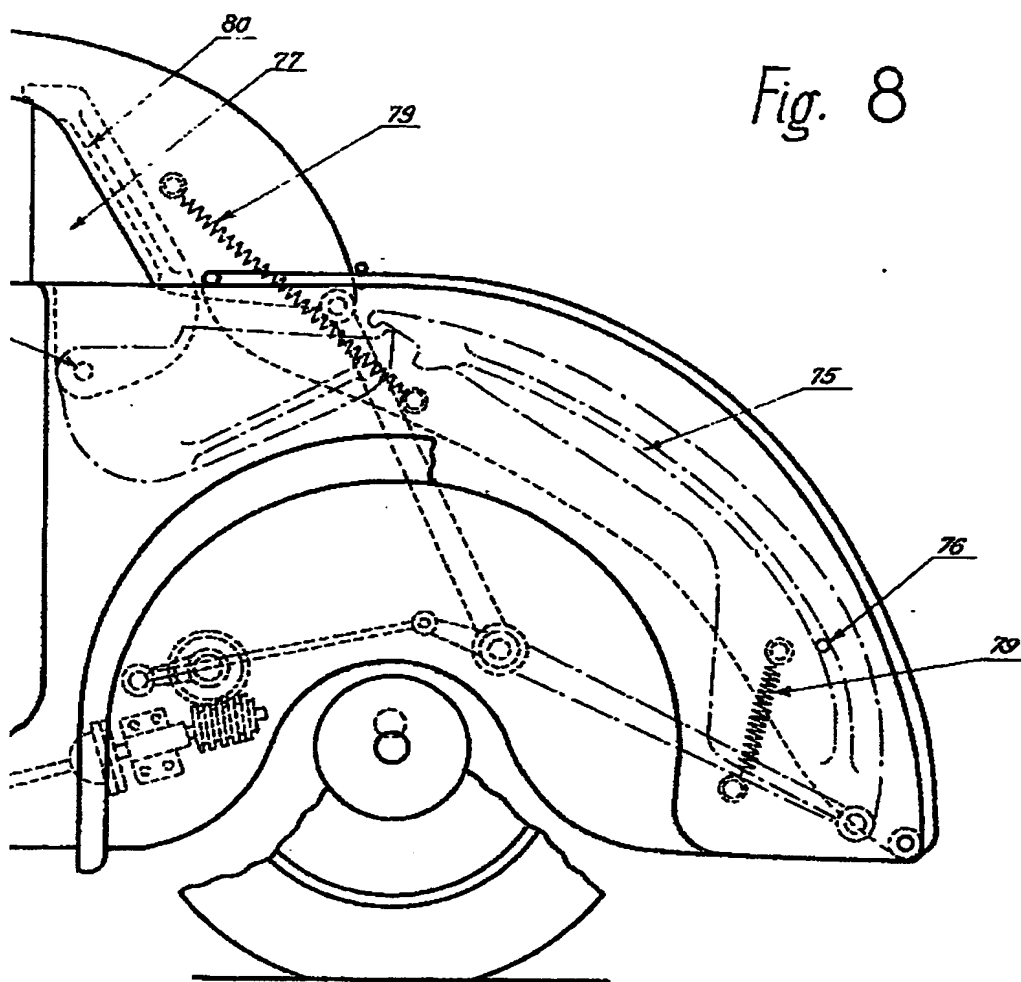


Fig. 8



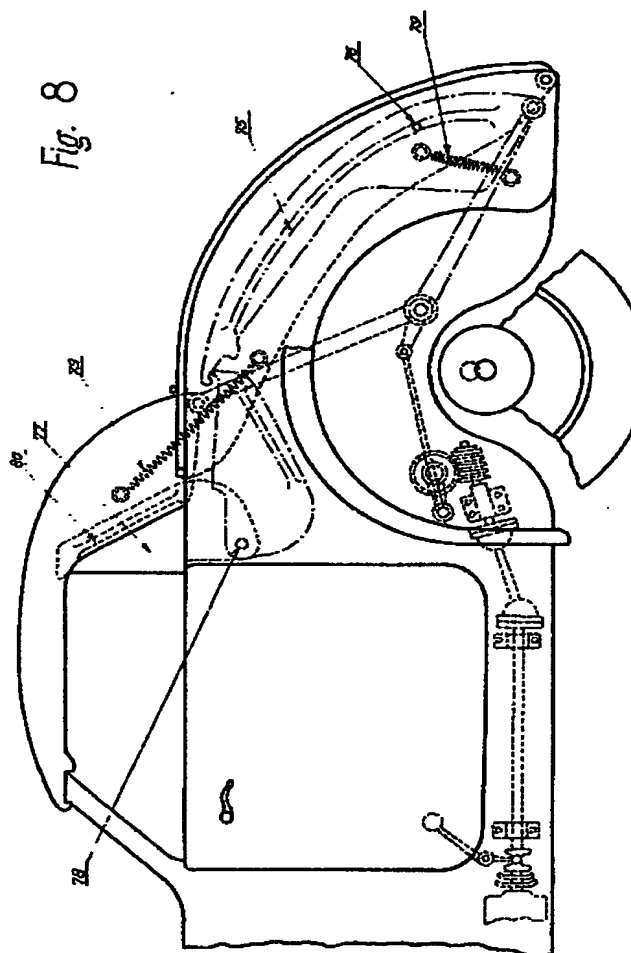
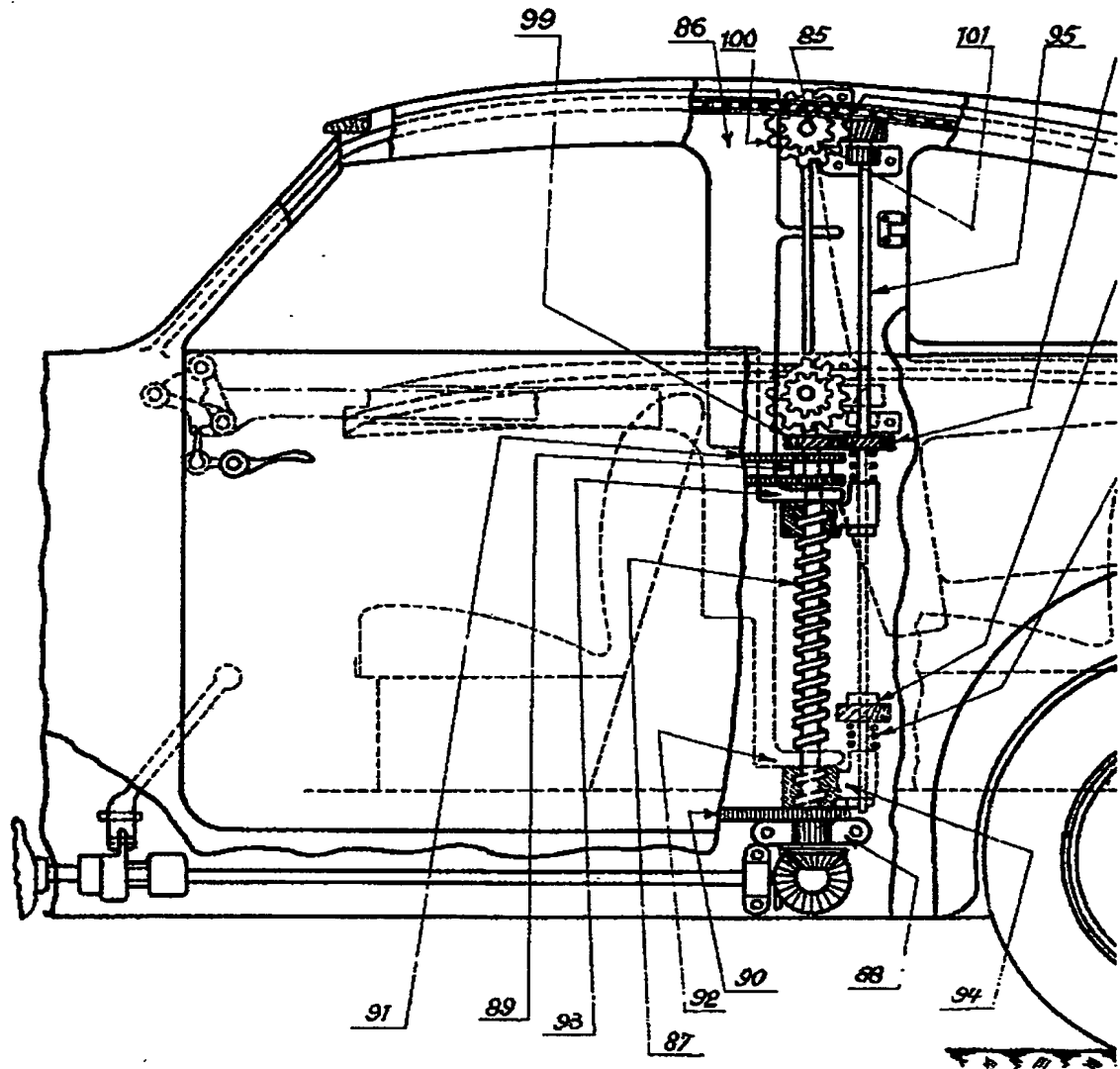
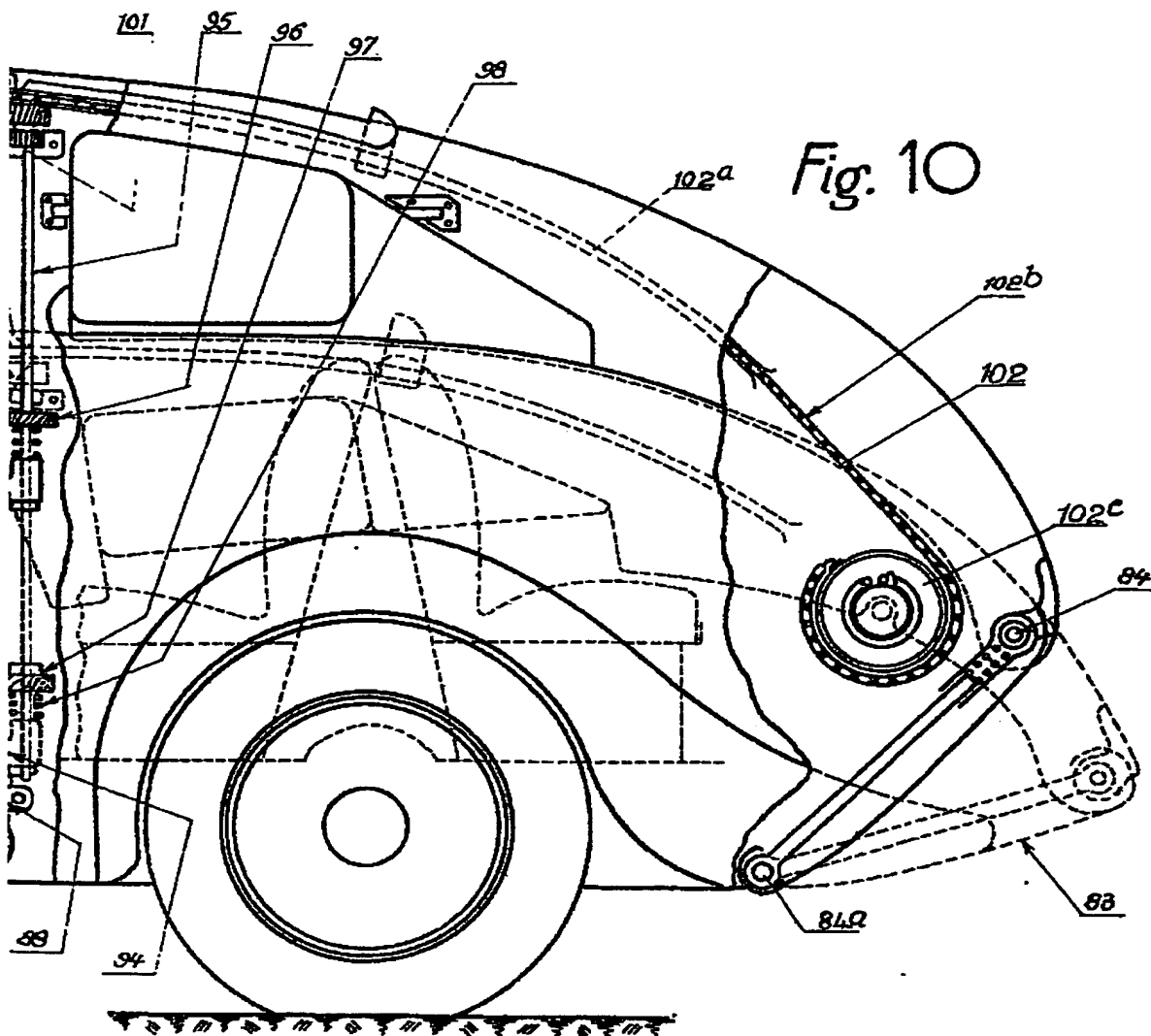


Fig. 8

(This Drawing is a full-size reproduction of the Original.)

[This Drawing is a full-size reproduction of the Original.]





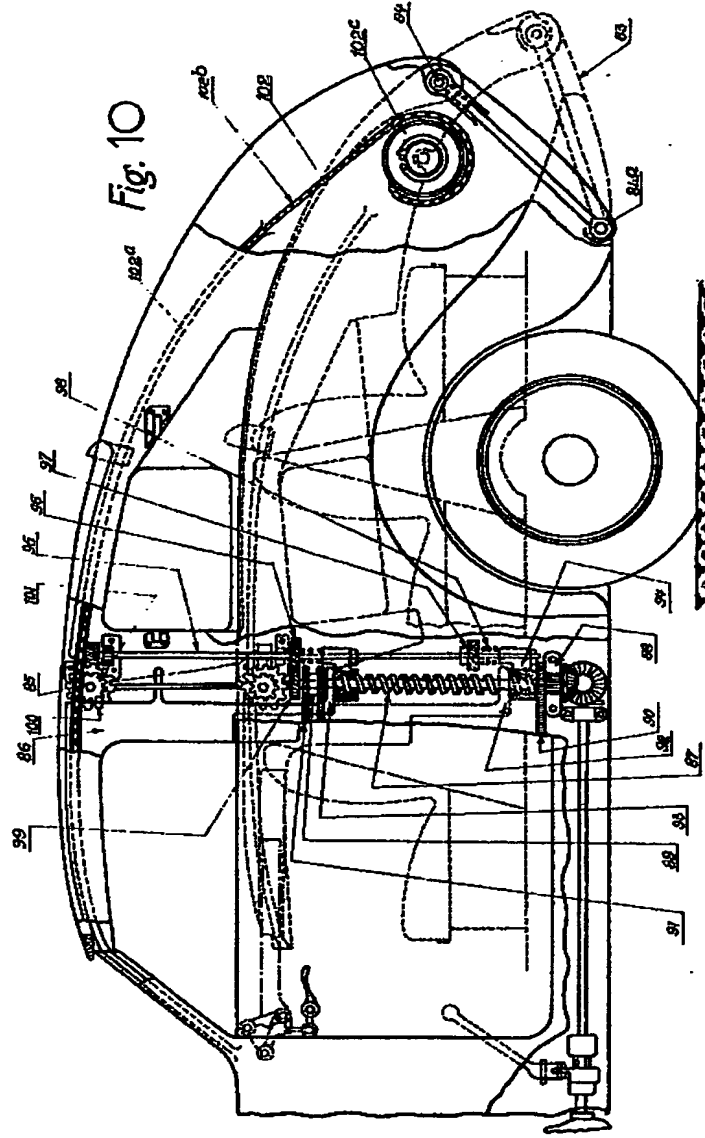
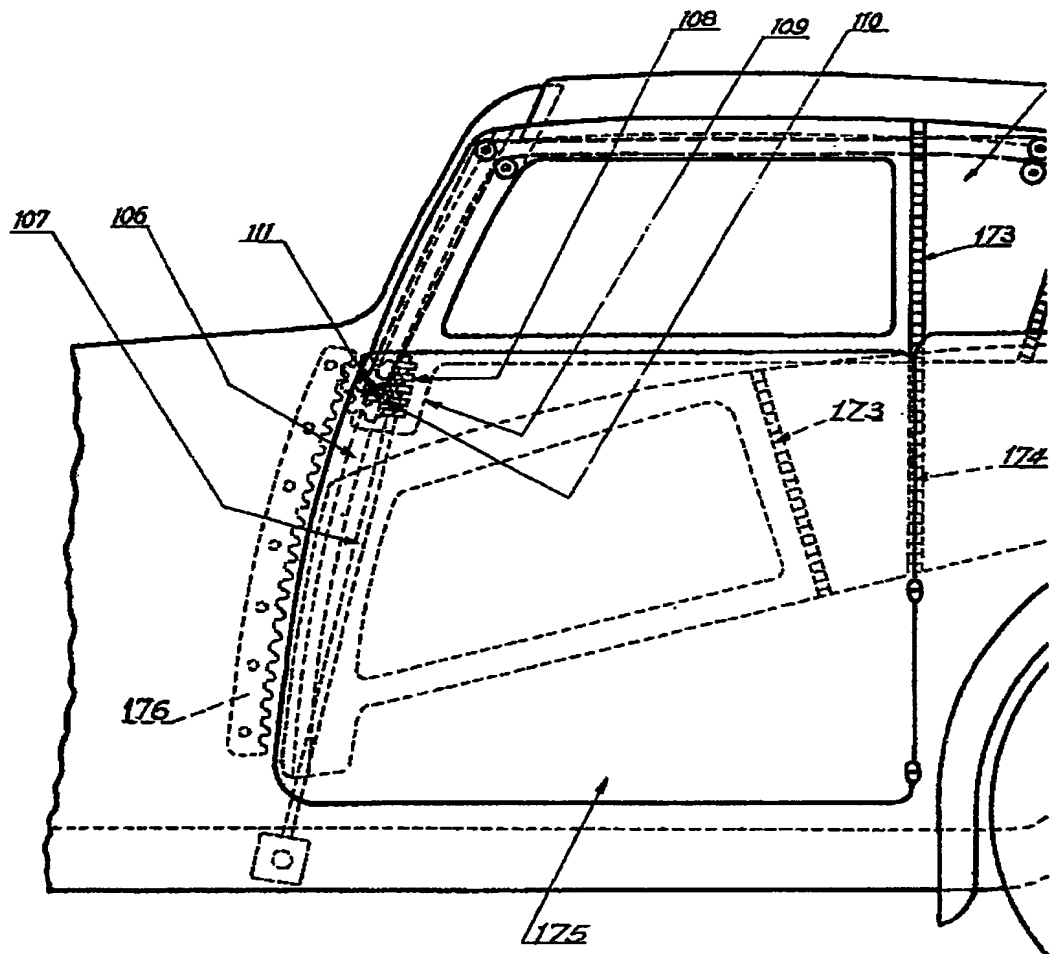
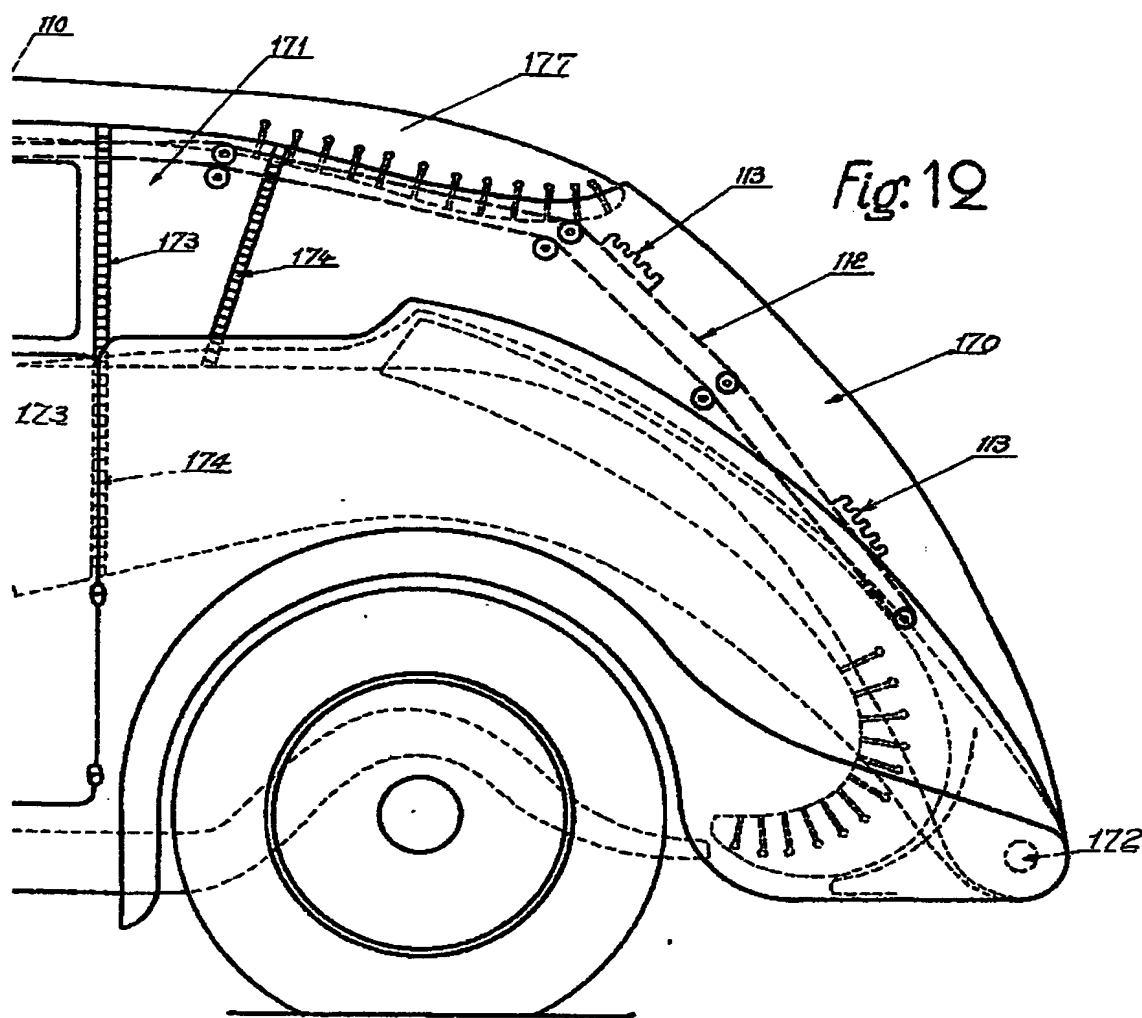


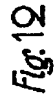
Fig. 10

[This Drawing is a full-size reproduction of the Original.]

[This Drawing is a full-size reproduction of the Original.]



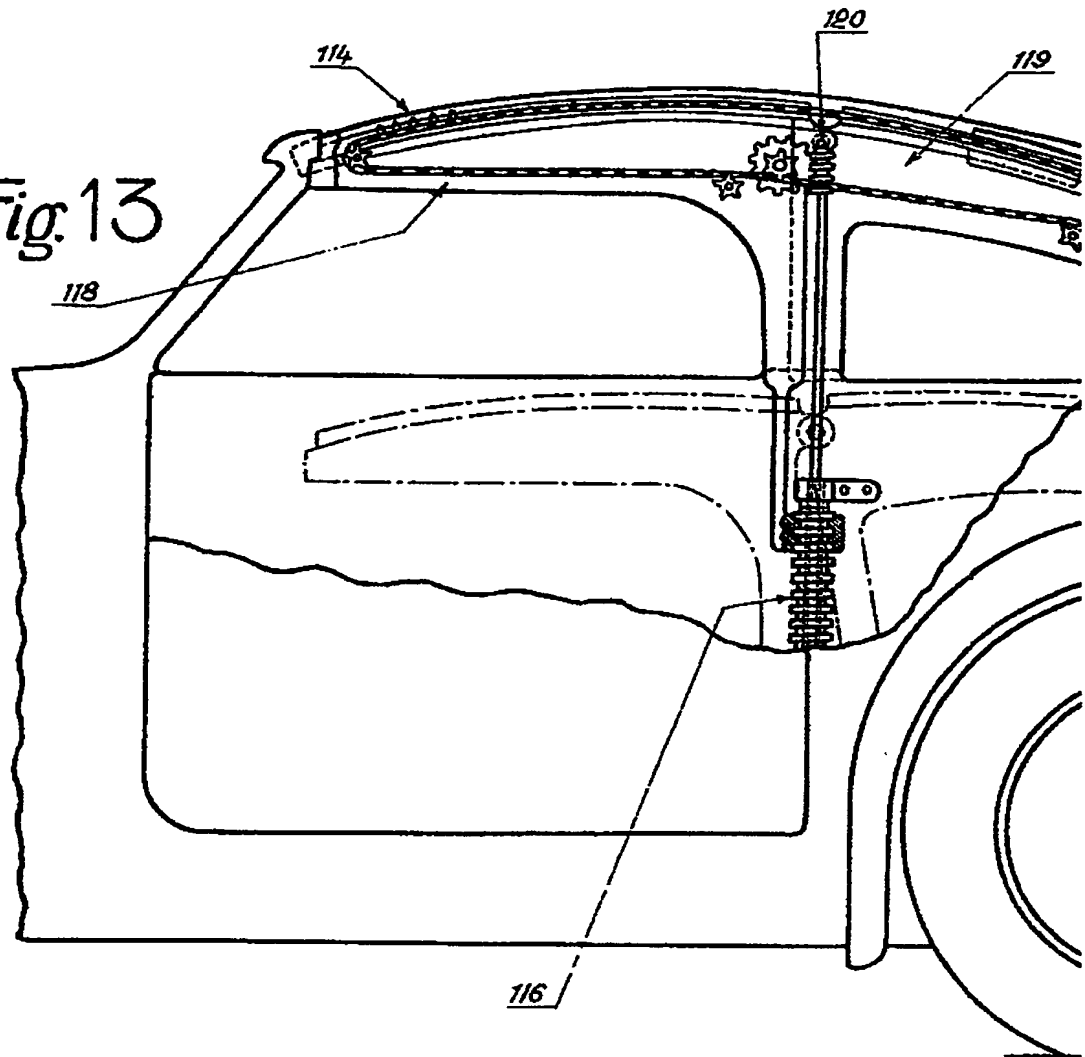




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[This Drawing is a full-size reproduction of the Original.]

Fig. 13



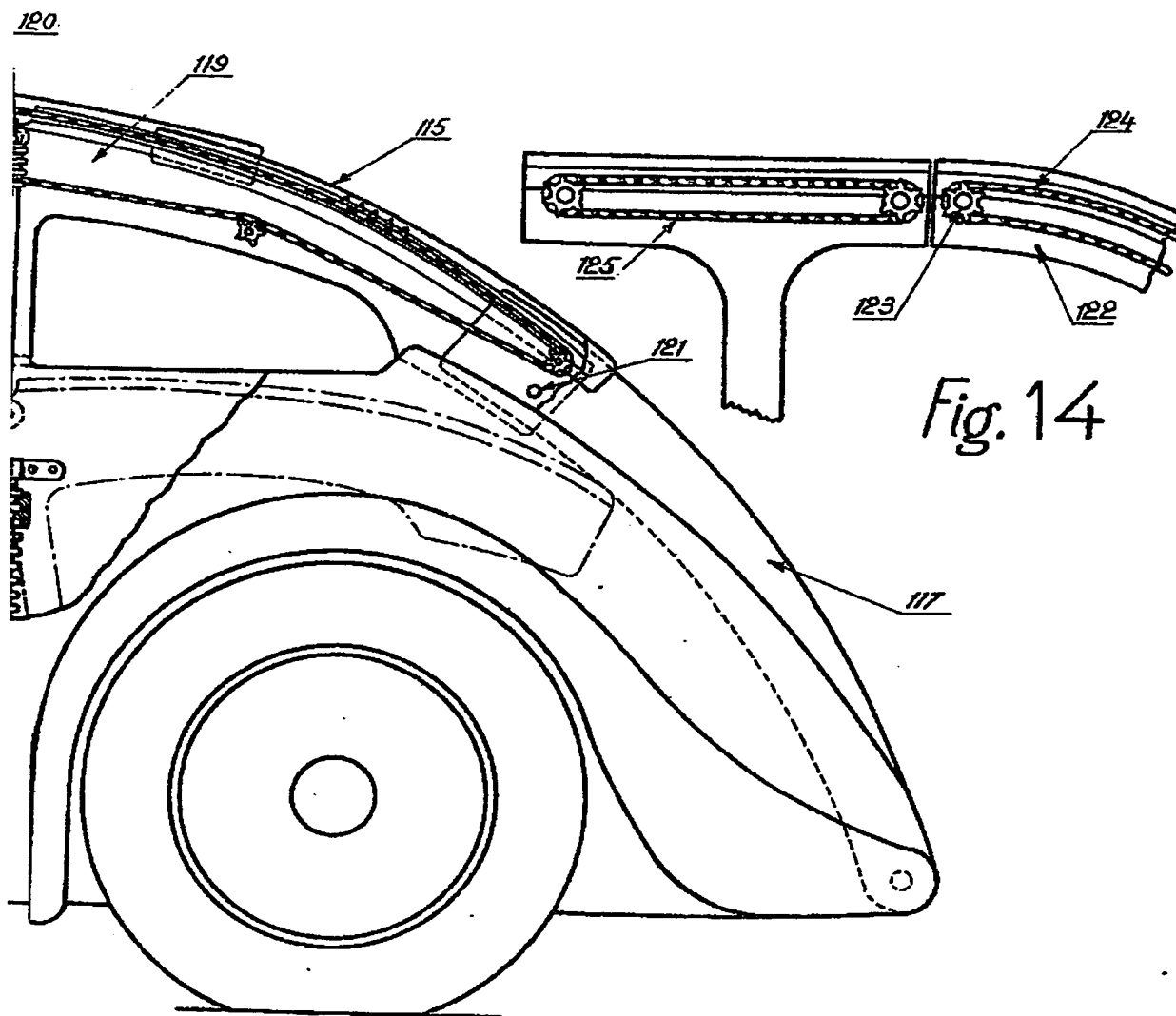
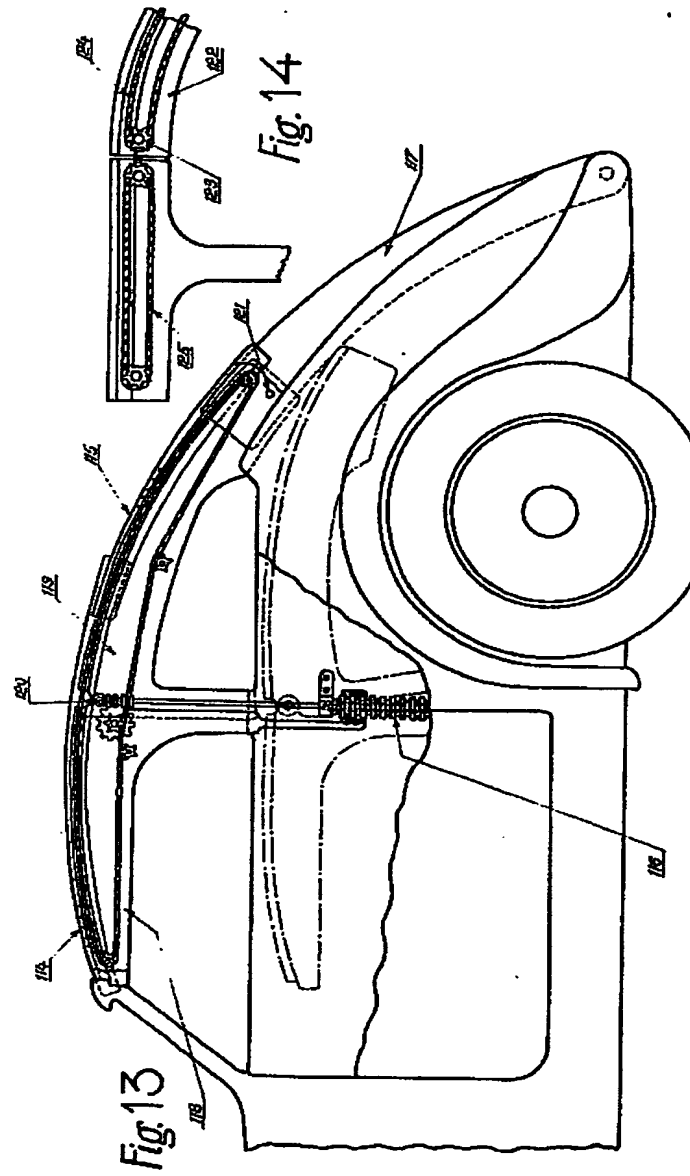
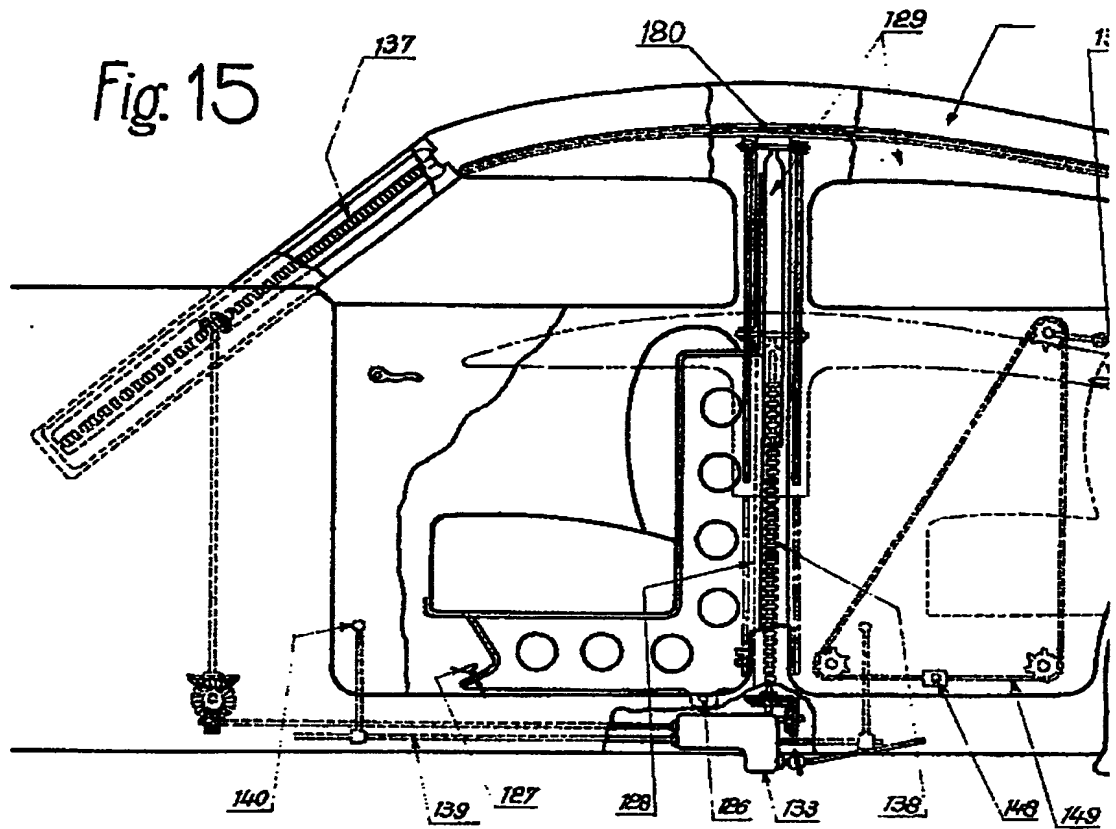


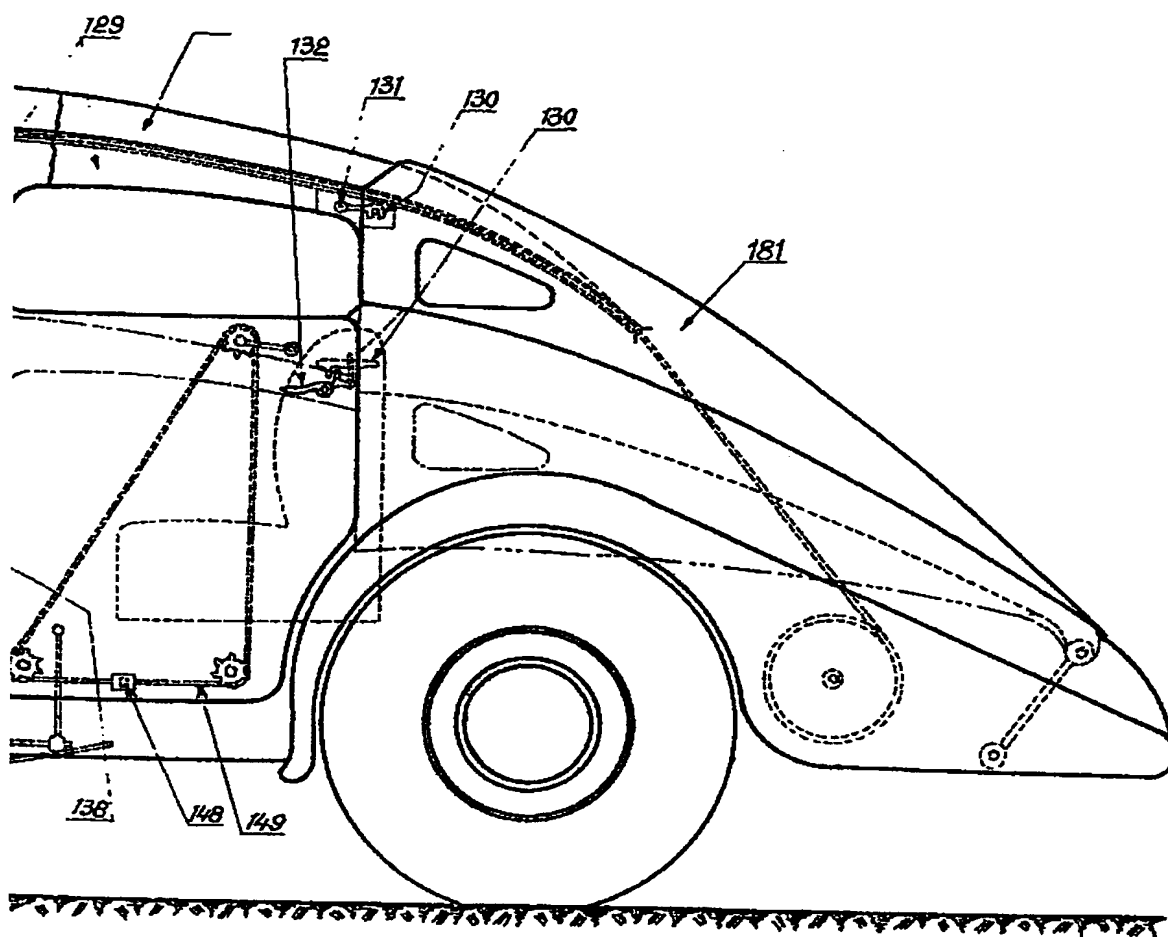
Fig. 14



(This Drawing is a full-size reproduction of the Original)



[This Drawing is a full-size reproduction of the Original.]



[This Drawing is a full-size reproduction of the Original.]

[This Drawing is a full-size reproduction of the Original.]

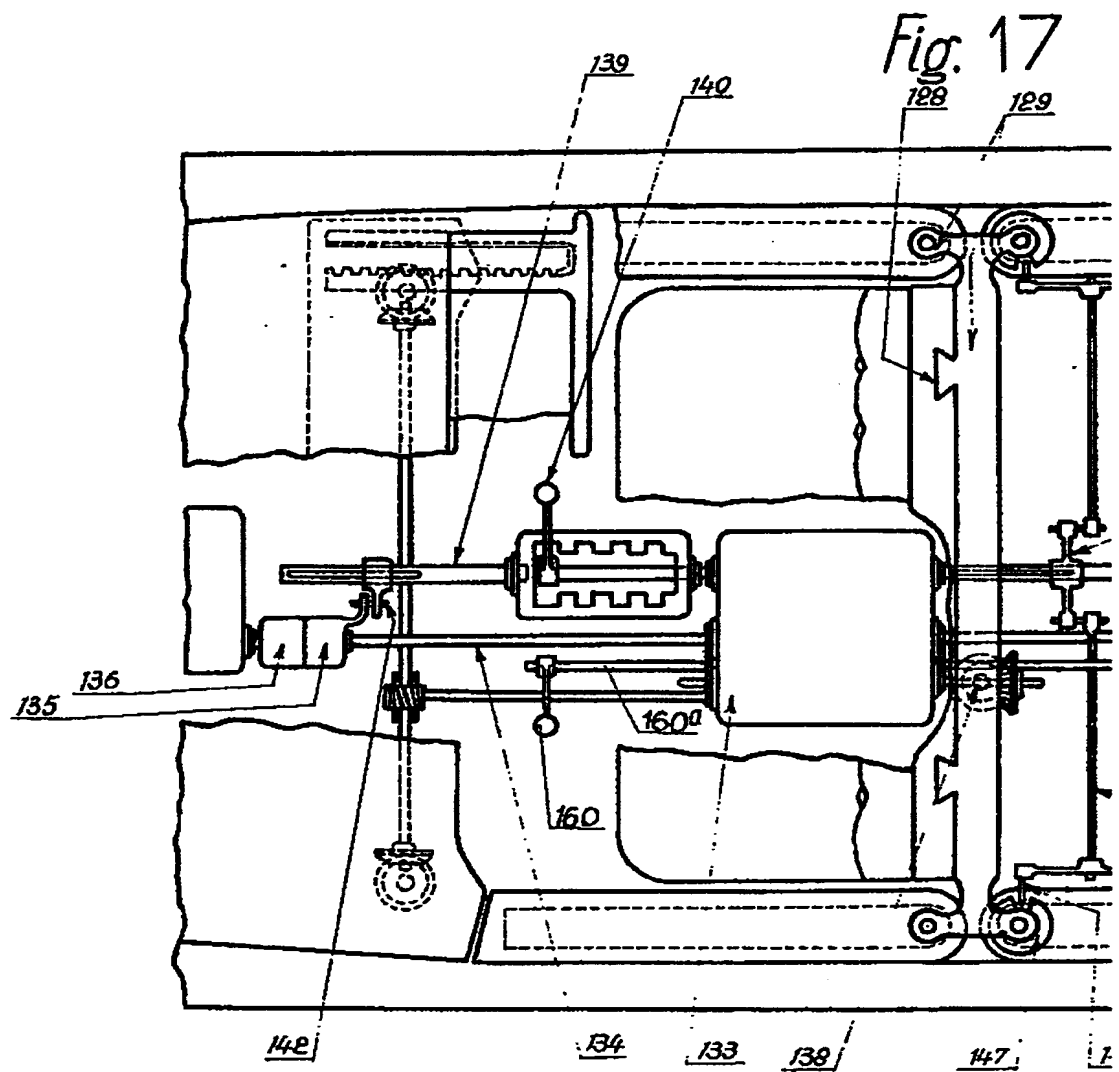


Fig. 17

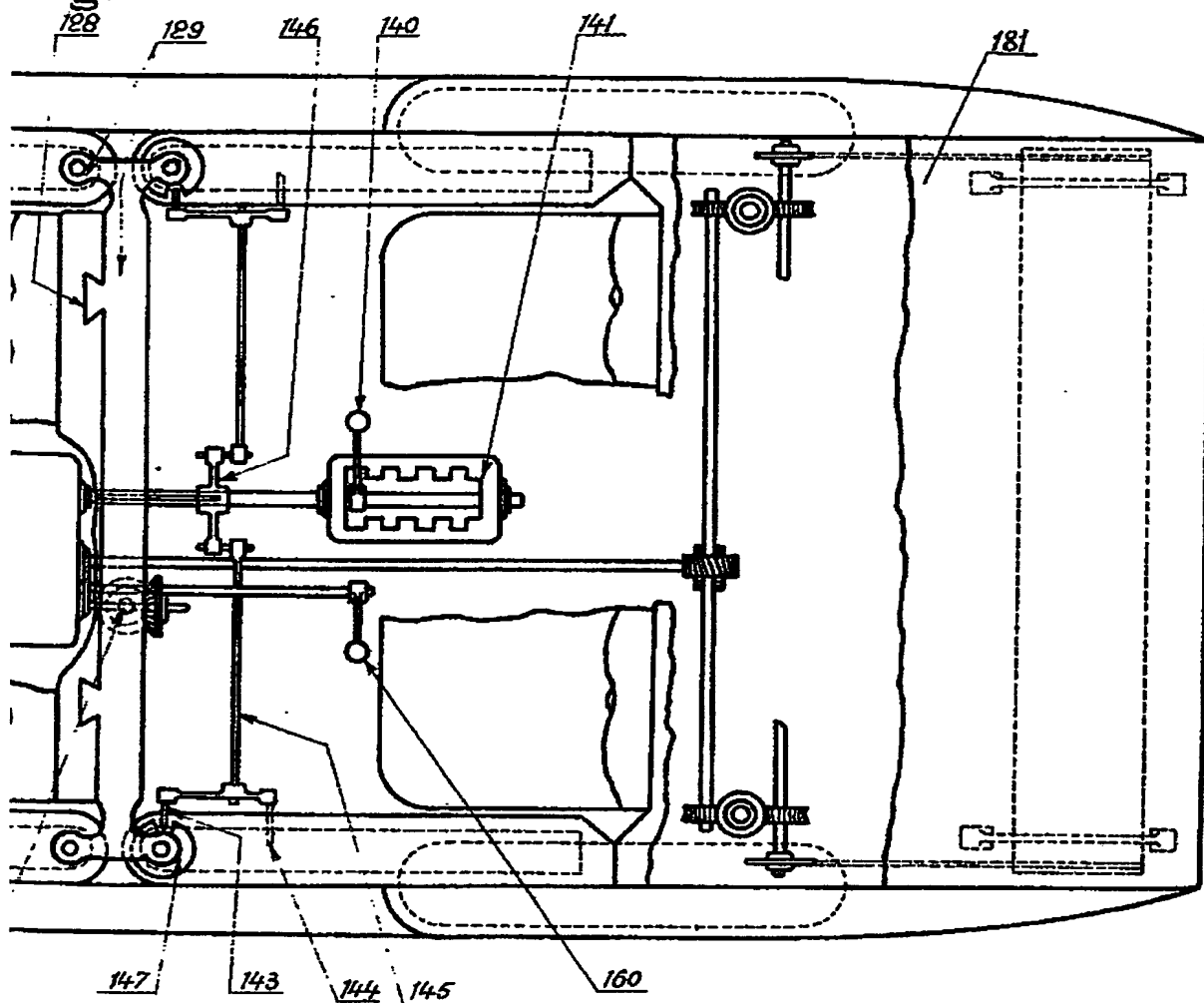
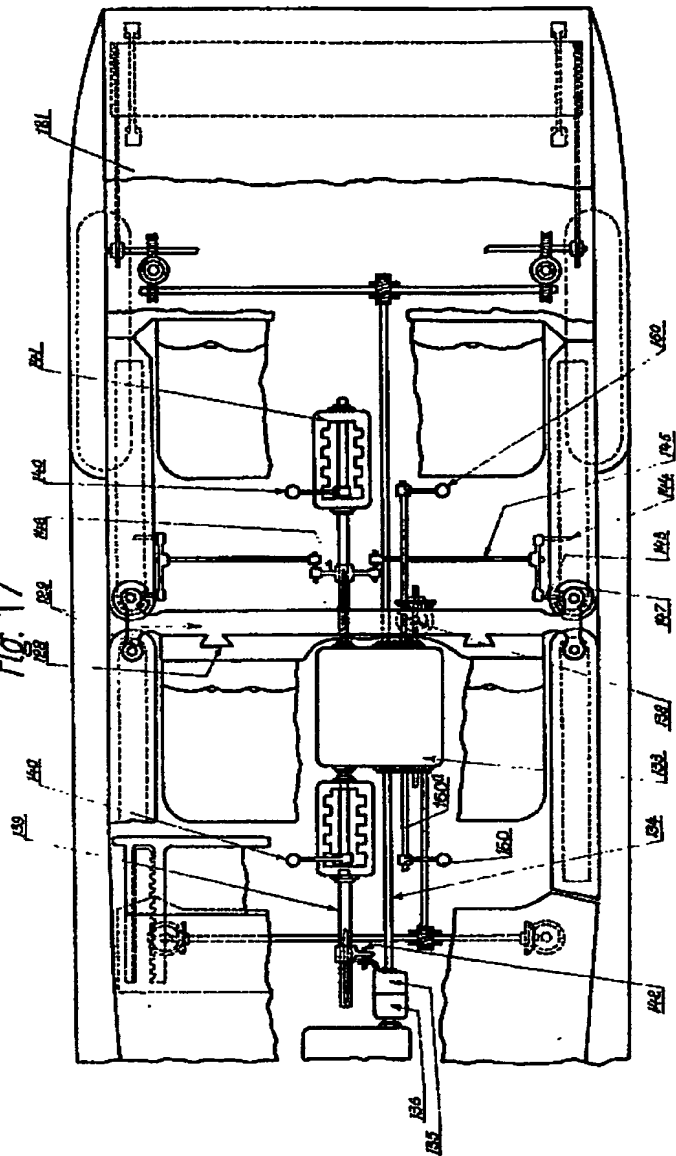


Fig. 17



[This Drawing is a full-size reproduction of the Original.]